RAILROAD GAZETTE

FRIDAY, AUGUST 24.

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Contributions.

Co-operation of the Officers' Associations.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your editorial on "The Railroad Officers' Associations," in your issue of Oct. 28, 1887, is beginning to bear fruit, as shown in a letter (a copy of which I send you herein inclosed) which I have received from the President of the Superintendents' Association of North America. The Roadmasters' Association of America will meet in Washington, D. C., Sept. 11, when immediate action will be taken in the matter referred to by the President of the Superintendents' Association. The report of the Roadmasters' Association of America, with all papers bearing upon the subject, will be forwarded to the Superintendents' Association in time for their meeting on Sept. 19, for such further action as may be necessary. This I hope will be followed up, as suggested by the correspondent to whom you referred in your editorial. The times appointed for the meeting of the Railroad Officers' Associations this fall would seem to indicate that they are falling into line, at least as to the dates of their meetings. The Roadmasters' Association meets Sept. 11, the Superintendents' Association of North America meets Sept. 19, and the Time Convention' meets Oct. 11.

The subject of the letter referred to is "Standard Frogs.' When this has been passed upon by the Roadmasters' Association and forwarded to the Superintendents' Association, why not carry out the suggestion of your correspondent? *i. e.*, after the action of the Superintendents' Association forward all papers bearing upon the subject to the "Supreme Court," the General Managers' Association (the Time Convention), where final action can be taken. By this method of procedure the subject of "Standard Frogs" can be disposed of in thirty days, if favorably considered by the General Managers.

It is to be hoped that final action will be taken in this matter of "Standard Frogs" by the associations in the order of their authority, and this subject be settled, thereby establishing a precedent by which the different associations can be governed for all subjects hereafter presented.

J. W. CRAIG,
President R. M. Ass'n.

Combustion Chambers.

Chicago, Milwaukee & St. Paul Railway Co.,
MECHANICAL ENGINEER'S OFFICE,
MILWAUKEE, Aug. 18, 1888.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It would be interesting to the lookers-on in the discussion of "deep fire-boxes vs. combustion chambers" to know whether "Deep Fire-box" used brick arches in those five engines fitted with combustion chambers; also what size and design of blast nozzle he used.

It seems to me that in the case described the arrangement of front end, and the fact that a deep fire-box was used, has caused the trouble for which the combustion chamber received the blame.

The greatest advantage claimed for the combustion chamber is that it can be combined with a shallow fire-box of larger width than usual, so that with a slow blast a large thin fire may be burned very slowly, and the conditions ruling in a stationary boiler with natural draft can be more fully approached. Under these conditions no cinders should be thrown.

But when a deep narrow fire-box and diamond stack, with the attendant obstructions to the draught, are combined with a combustion chamber, and the exhaust-nozzle is contracted sufficiently to make the engine steam, there is little cause to wonder that the cinders are drawn toward the front end with velocity enough to cut steel.

If a volume of coal sufficiently large to supply the requisite amount of heat had been burnt under a blast too slow to tear the fire and lift cinders, the sheet in the combustion chamber would not have been cut through by cinders, nor would the flues have been plugged up.

This could never have been done with a deep fire-box, although it might have been approached, for it is pretty certain that in order to obtain a sufficient grate area for free steaming, with a very thin fire, the limited width (35 in.) made necessary by having the box *deep* would make the length excessive for uniform firing, and with the ordinary short narrow box and thick fire no blast sharp enough to make steam would be slow enough to avoid throwing cinders.

That it can be done, with economical results, with a large shallow box on top of frames, with a combustion chamber and large nozzle, was clearly proved by a test made on the Pennsylvania Railroad in 1884 or 1885, where a locomotive with a Wootten fire-box, borrowed from the Philadelphia & Reading Railroad for the occasion, hauling some 50 gondolas loaded, evaporated over 9 lbs. of water per pound of coal, and that too without drawing any cinders through the flues worth mentioning.

The engine carried, I think, 130 lbs. of steam, and steamed freely, so much so that it was currently reported that the fireman spent most of his time dancing a jig upon the "hurricane deck" (canopy on front end of the tender).

Our experiments in these matters point toward the arrangement I have indicated, although this company has no engines so fitted up in service.

CLARENCE J. ALLEN, Asst. Eng'r Tests.

The Extension Smoke-box.

PITTSBURGH, Pa., Aug. 18, 1888.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The recent performance of Engine No. 171, Central Railroad of New Jersey, reported in your last issue, presents, among other elements of interest, a result which is worthy of careful consideration, in relation to its bearing upon the principles governing correct practice in smoke-box volume and spark arrester construction. I refer to the small amount of solid residuum carried into the smoke-box in these tests, being about one pound in each day's run. The smoke-box extension of the engine is stated to be 15 in. shorter than the usual ones, and is therefore presumably about 21 in. long. Assuming the smoke-box proper to be 36 in. long, the aggregate length will be 57 in.

It has been uniformly, and is now, the contention of the writer that the application of an extended smoke-box, more particularly in locomotive boilers of the comparatively large diameters now and recently constructed, is, for reasons that I need not encroach upon your space to enumerate, not only useless, but positively detrimental, and that such advantageous results as have been attained in engines provided with extensions, have been due to appliances and conditions wholly independent of the extension, as an open stack, a deflector and netting in the smoke-box, exhaust nozzles of increased diameter, a brick arch in fire-box, and more careful and intelligent firing; all of which are equally applicable with a smoke-box of normal dimensions. How far this position is correct, or how far sustained by the results obtained in existing constructions, as those of the Central Vermont and Chicago & Alton, described in the last Report of the Master Mechanics' Association, and others, I do not here propose to discuss.

It will doubtless be admitted that the extended smoke-box is a spark *receptacle* and not a spark *arrester*, as well as that with complete combustion in the fire-box, under an exhaust blast so light as not to draw solid matter through the tubes into the smoke-box, the extension would be superfluous. These conditions are apparently closely approximated in the performance of engine No. 171, and there being no necessity for a 21 in. extension, or *any* extension, to contain a daily accumulation of 1 lb., or thereabouts, of ashes, the application of an extended smoke-box upon this engine involves an increase of weight and smoke-box volume without any apparent use or function, and without any supposed advantage in justification of the departure from an established relation of smoke-box volume to grate area, the correctness of which has neither been controverted nor disputed. The extension of the *rear* end of the boiler of engine 171 is too obviously beneficial to need explanation or argument, but that at the front end is clearly useless, on the makeshift basis that an extended smoke-box may serve to bolster up the deficiencies of a cramped fire-box and imperfect combustion, and, upon well-founded mechanical principles, is an absolute disadvantage.

The views above expressed are applicable with still greater force to the Wootten engine of the Union Pacific Railroad, illustrated and described in the *Railroad Gazette* of June 15, 1888, which exhibits a mechanical anomaly suggestive of an athlete posing on crutches, that is, a fire-box and combustion chamber designed for and apparently attaining a very thorough and perfect combustion, combined with an extended smoke-box, which would be useless if such combustion is attained. The writer's observation of the operation of other engines with a similar boiler and a smoke-box of normal dimensions, confirms the correctness of the statement made in the *Gazette's* description of the Union Pacific engines, viz.: "The large area of the grate prevents any appreciable lifting of the fire, and the small pieces of coal that are sucked up by the blast are burnt on their way to the flues, owing to the high temperature of the brick arch or wall." Under these conditions, and still further in view of the greater length of extension and the character of the fire-box and combustion chamber, the objection which I urge against the extended smoke-box of engine 171, similarly and for the same reason obtains as to the Wootten engines of the Union Pacific, or to any engine with a Wootten or other boiler having a fire-box of sufficient dimensions and draught appliances of proper construction. J. SNOWDEN BELL.

Block Signals.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The expense incurred by railroads operated under the block system would naturally lead to the conclusion that it was an additional safeguard against accident. But with an experience of more than 10 years in train service as freight and passenger brakeman and conductor on roads so operated, I claim that the facts do not sustain the theory. I have yet to learn how the system will prevent an accident, while, on the contrary, I can recall many instances when it has been the cause, indirectly if you choose, of rear end collisions. Advocates of the system will claim that it is owing to neglect of positive orders by the trainmen that makes a rear collision possible. That I concede, and it is my objection to the system that it will make the most careful flagmen and conductors careless. It offers a premium on negligence. It makes trainmen negligent in the discharge of positive orders, less sensitive to danger and the necessity of protecting themselves against following trains. The responsibility of protection is, in the face of positive orders to the contrary, divided between the train crew and the operator, or block. Trainmen do and will rely on it for protection, any rules to the contrary notwithstanding. If two trains were not permitted on the same block, and no clearance orders given contrary to the indications of the semaphore; and if enginemen of following trains were informed that they must rely solely upon the block, as no flagman from the preceding train would be sent back to protect it, the sysem would accomplish the result intended.

Observe the movement of the rear brakeman on the Central of New Jersey when his train slows up to make an unusual stop. If he is where he has not an unobstructed view in the rear of his train, he is off and back with a flag before his train comes to a stand still. Do you note the same vigilance on a road operated under the block system? My experience is that the brakeman there usually wants to find out what the trouble is; wonders how long they will be detained, and if he goes back at all, it is a very short distance, and then only after the train has stood five or ten minutes. Running close behind him is an extra train, or a delayed passenger train, anxious to make up as much lost time as possible. The engineman arrives at A, is stopped by the block and informed that train No. — has not cleared B at the time he receives his order; that he may go on, but must run cautiously. But away he goes at schedule speed, if not faster. He is behind time, he has the opportunity, and desires to make a good run —all enginemen do. The passengers demand it, and the officials require it of him. He reasons that he is perfectly safe in maintaining a high rate of speed, because if the preceding train has not cleared B it will have a flag out far enough behind to stop him. That is where the system invites disaster. If he knew that no flagman would be sent out from the train ahead he would not hit it. He would "run and look," prepared to stop within a train length where the view ahead was obstructed.

The most extensive system operated under the block did not have a rear collision during the Centennial in 1876, and its passenger business was enormous. It placed on its passenger trains its most reliable freight conductors and brakemen, and it was due to their vigilance, and not to the block (which was then a new thing there), that they were so free from accident. Just at the close of the heavy traffic, a local train in charge of conductor Thomas Gallagher, ran into a freight at Linden, and a few days afterward he ran into another freight that was pulling into a siding at Menlo Park. Both accidents were indirectly caused by the block system.

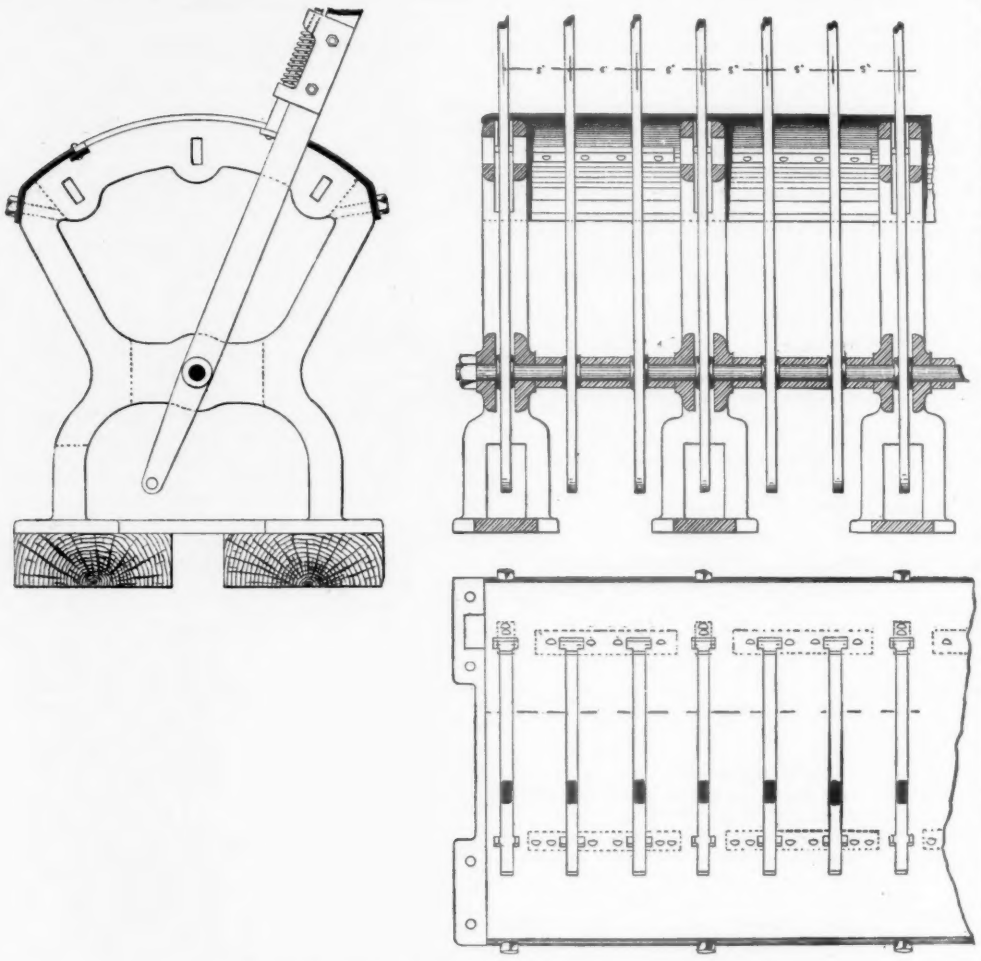
Quite recently I went into the office at A and reported my train clear of main track on a siding, half a mile south of the station. The operator looked at his train-sheet and replied: "I have you reported clear at B, at—" stating time. I had not been south of switch when my train was side-tracked, and B was 4 miles beyond it.

I have asked hundreds of railroad men their opinion of the system, and I have yet to hear the first conductor, engineer, dispatcher, or any man directly connected with train service, say a word in its favor. LANGDON.

Magnetism in Watches.

Mr. C. K. Giles, of Chicago, and who is at the head of the firm of Giles Bros. & Co., which holds the position of chief watch examiner for a number of important railroads, has just issued in pamphlet form, the paper on magnetism in watches read by him at Alexandria Bay June 19 last.

Mr. Giles has made a profound and careful study of magnetism and its influence on iron, and goes into the subject in a very elaborate manner. His arguments and deductions are illustrated and enforced by good engravings, and he shows clear proofs of the statements he makes concerning the influence of thunder storms and other magnetic disturbances on the iron of engines and cars, on the track, and on the steel in watches, and demonstrates the influence which the larger masses of iron here mentioned must have on the smaller—that is, the influence of the engines on the steel in watches. Mr. Giles' paper is interesting reading and should be in the hands of all superintendents and master mechanics. We have not space to give it here in full, but quote one or two of the more interesting passages. Mr. Giles states that it is the experience of watch repairers that four times as many main springs are broken in each of the summer months—June, July and August—as in the other months of the year, and also that the electric disturbances, such as thunder storms, cyclones, etc., invariably result in a large crop of broken main springs. In proof of the good results following the use of the Giles anti-mag-



NON-INTERLOCKING LEVER STAND FOR FREIGHT YARD.

West End Meadows Yard, PENNSYLVANIA RAILROAD.

netic shield in watch cases the following quotations from tests in actual practice are given:

"By the official report of watches on the Chicago, St. Louis & Pittsburgh road, the rating for the shielded watches for the North Division was: First quarter, average variation 1 second per day; second quarter, average variation ¾ second per day; third quarter, average variation $\frac{3}{10}$ second per day. On the Wabash, about 400 watches show a variation: First quarter, average 1¼ second per day; second quarter, average 1 second per day; third quarter, average $\frac{3}{10}$ second per day. On the Chicago & Northwestern about 1,500 watches show an average variation of about 1 second per day for the second quarter." Such astonishingly close running could not be obtained without this protection, says Mr. Giles.

Concerning the use of steel in the construction of watches and the question whether some non-magnetic metal is not equally serviceable, Mr. Giles goes on to explain, with drawings, the nature of the molecular construction of iron and steel, and the changes in this structure which result from hammering or rolling, and from ordinary wear and tear. Only the finest steel will stand the effects of changes in temperature and other influences which watches are subjected to. Mr. Giles concludes:

The above are facts in physical science, which must be considered in horology. These illustrations and explanations will make plain the reasons why the non-magnetic or soft metal watch may possibly run well for a few months and then change the rating radically, and refuse to take its even rating again. In non-magnetic metals the necessary compactness for elasticity must be obtained by physical force, compression, rolling or hammering; in actual use, this same force is operating to undo the work it has done before, and it will accomplish it sooner or later. On the other hand, steel is the only metal which can be fire-tempered or reduced to a condition of extreme compactness, necessary for permanent elasticity, without the aid of physical force. It has the property of elasticity to a greater extent than any other known metal: its molecules seem to have the power of sliding one by the other and returning to, or retaining, their original position—a sort of inter-crystalline elasticity, not possessed by any of the non-magnetic metals—a sort of magnetic life, as it were—its magnetic and elastic capabilities seem to go together. If you reduce this steel to such a state of softness as to destroy its elasticity, it would correspondingly reduce its magnetic power. Steel is, pre-eminently, a metal possessing magnetic life, and is the only metal possessing all the qualities to make a reliable watch or locomotive.

Switching at the Meadows Classification Yard Pennsylvania Railroad.

BY HENRY M. SPERRY.

East-bound freight over the New York division of the Pennsylvania Railroad, for New York City and vicinity, is sorted out or classified for the various freight piers and freight houses at the classification yards at the west end of the Meadows, and at Harsimus Cove.

The classification yard proper has 12 parallel tracks leading off from one diagonal track, which is laid at an angle of about 7° with the principal axis of the yard. Or more precisely the diagonal track starts from track No. 2, which is entered by a cross-over from track No. 1.

The switches of the classification yard are operated by means of a 12-lever, non-interlocking machine, enabling one switchman or leverman to control 13 switches, spread over a distance of 1,140 ft. Without the machine at least two men would be required.

The most westerly switch is the cross over between No. 1 and No. 2 main freight tracks, and is about 440 ft. from the switch tower. Both ends of this cross-over are worked by one lever. The switch farthest east, No. 12 track, is about 700 ft. from the tower. The 12 tracks of the classification yard are assigned as follows:

Track No. 1, Harlem River freight.
Track No. 2, Jersey City slow freight.
Track No. 3, West Shore Railroad freight.
Track No. 4, Piers 4 and 5, New York City.
Track No. 5, Platforms 1 and 3, Jersey City.
Track No. 6, Platform 2, Jersey City.
Track No. 7, Piers 27 and 28, New York City.
Track No. 8, Grain.
Track No. 9, Marion Station, freight.
Track No. 10, Coal for company's use.
Track No. 11, Long lumber, piles, etc.
Track No. 12, Communipaw freight.

The road engine leaves the train on track No. 1, west of the crossing between tracks 1 and 2. The yard master then makes up from the card manifests, or if they fail to give the necessary information, from his report of cars to arrive, three slips, showing the order in which the train is to be cut up, and the numbers of the tracks on which the cars are to be placed. One of these slips is given the conductor, one to the engineer of the pushing engine and one to the leverman. The conductor's and leverman's slips are the same, and show the order in which the switches are to be set. The engineman's slip shows the order in which the cars are to be cut off. If the leverman's slip should read 1-2-12-1-2, and the engineer's slip 2-1-2-1-1, it would show that switch No. 1 should be set, and 2 cars placed on No. 1 track, then switch No. 2, and one car placed on No. 2 track, then switch No. 12, and 2 cars placed on track No. 12, and so on. If hand switches were used in this series of operations the switchman would have 930 ft. to run from No. 2 to No. 12, and the same distance back again to No. 1. The saving of time and labor which is effected by grouping the levers in a frame can easily be imagined.

The engine does all its pushing from track No. 2, it being fitted with a very convenient form of pushing pole, operated with ease by means of a lever. The drawings make this very clear. Those who remember distinctly the push pole used in shifting in the Harrisburg yard, shown in the *Railroad Gazette* of Dec. 24, 1886, will see that this later one is considerably simplified in details.

The lever machine consists of 12 straight levers, 5 ft. 9⅞ in. long, pivoted on an 1¼ in. shaft, and spaced 5 in. between centres. This shaft is 6 ft. 10 in. long for 12 levers and 4 spare spaces and is supported every 15 in. in a cast-iron frame. These frames consist of old three-throw switch stands no longer standard, which if not made use of in this way would be scrapped. The stroke of the levers is regulated by the slots cut in the boiler iron plate, which is fitted over the top of the frames.

The levers do not interlock in any way with each other, but as no signals are used, except the switch lamps turning with the switch, it will be seen that interlocking would be of little value. Also from the nature of the drilling at this point interlocking between the levers is hardly necessary. But one engine is used, therefore no collision can occur except between it and the cars it is pushing, and no form of signals or interlocking would prevent this. If, however, at any point it is desirable to interlock the levers some form of Stevens locking could be fitted to them.

The drawings give a good idea of the machine. It will be seen that by simply changing the lengths of the plate and shaft it can be adapted to any number of levers.

The machine is placed on the second floor of the tower, and the pipe connections carried to the ground level by means of bell cranks. As the pipes are carried close to the wall but little space is taken up on the first floor, and this room is used by the brakemen when not on duty. It is fitted up with a number of lockers for their spare clothing, etc. The yard master has his desk in the room with the machine, giving him a good view of the yard.

The connections to the switches are made in the usual way, 1 in. gas pipe carried on rollers, spaced 7 ft. apart. The switches are all point switches, and not provided with facing point locks, but no trouble has been experienced from their omission, sufficient pressure being kept on the switches, through the connections, to insure their facing close up to the stock rail. Even if facing point locks had been provided there would be nothing to insure their being used, unless interlocked with a signal, as otherwise the leverman would be very apt to save himself the trouble of throwing these additional levers.

But although facing point locks are successfully omitted here, the conditions are vastly different from those at a junction or on main running tracks, where trains run at high speed. Here nothing but freight cars pass over the switches, and at a low speed.

The machine was made at the shops of the company, and has been in service over eight months. The saving in labor where a large number of yard switches have to be operated, would more than repay the cost of a plant of this kind. The maintenance does not exceed $6 a month. Similar apparatus is to be put in at other yards.

New England Roadmasters' Association.

The report of the sixth annual meeting of this body is continued from last week. In our report of the first day's proceedings were several printer's errors, which should be corrected. Mr. W. E. Clark, Roadmaster Vermont Valley Railroad, was chairman of the Committee on Highway Crossings, not Mr. W. Cloud as printed. Mr. F. C. Clark, not C. F., is Roadmaster of the Housatonic. This gentleman spoke in favor of a rail having a long radius for the top curve, or pretty flat on top, not *partly* flat, as printed.

RAILS.

At the session of Wednesday evening the discussion on this subject was continued.

Mr. ELLIS (Providence & Worcester) advocated a hard rail with heavy section. By increasing the size of the section, the hardness and, consequently, the wearing qualities of the rail can be increased without greater liability to breaking; but the roadmasters cannot say what the chemical constituents of a rail should be. As to inspection for line and finish they *can* do something. He keeps two foremen inspecting steel at the mills, and believes that mill inspection should be rigorous.

Mr. L. H. PERKINS (N. Y., N. H. & H.): Has to take what comes to him and has nothing to say.

Mr. W. F. CLARK (Vermont Valley): Mr. Patch inspects the rails purchased for the Connecticut River, and Mr. Clark can see the difference in the rails so inspected.

Mr. J. R. PATCH (Connecticut River): Has inspected all the rails bought by his road for 16 years. A few years ago he went to the mills when a run began on a contract for his road, and threw out 400 crooked rails in one forenoon. He considers it money in the pockets of the roads to send their own men to inspect at the mills. Contract inspectors are not always to be trusted.

Mr. L. H. PERKINS would advocate inspection at the place of delivery. Then the bends that come in transit would be eliminated.

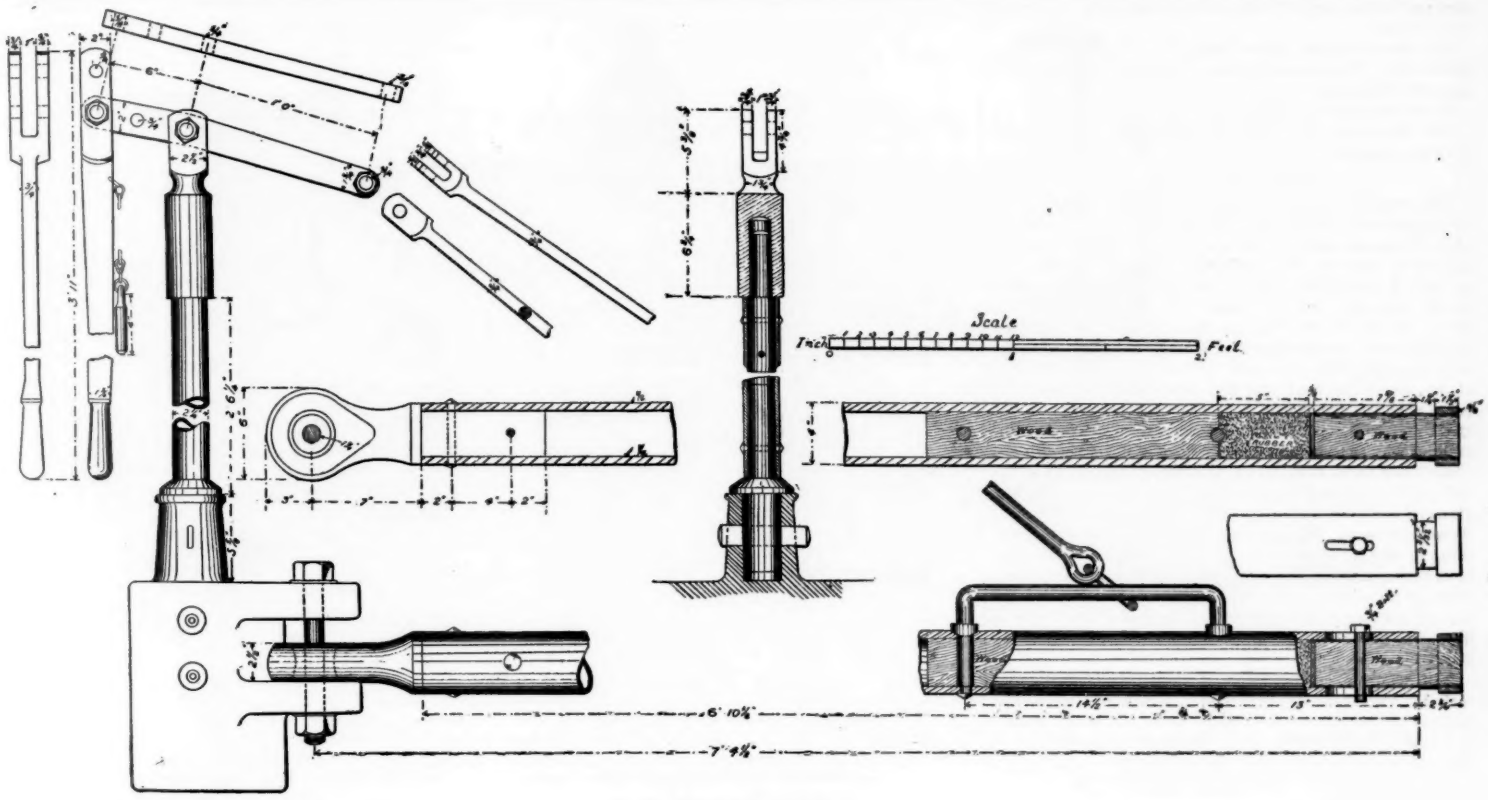
Mr. W. F. ELLIS did not think it likely that the mills would agree to this. Besides, the inspection at the mills would save time.

Mr. J. R. PATCH does not think that any mill would take an order for rails to be inspected at the point of delivery. It frequently happens that a rail is thrown out at the mill that can be made a good rail by five minutes' work.

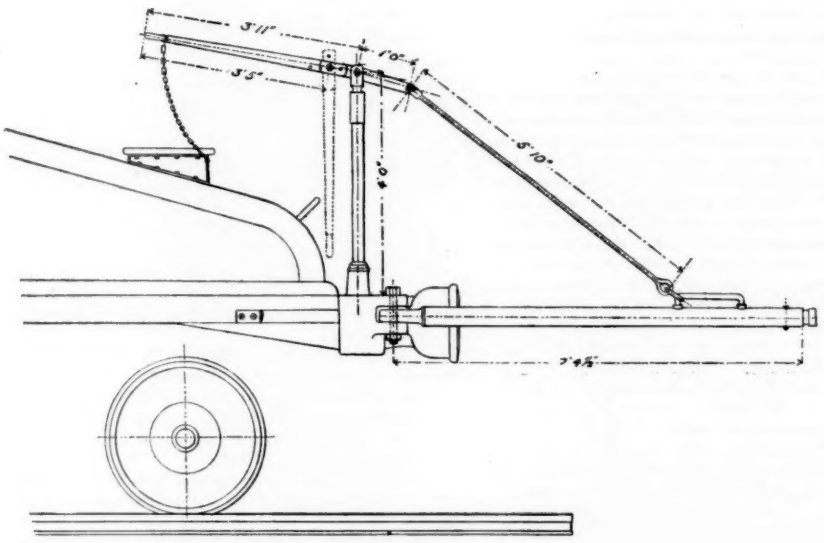
Mr. J. S. LANE: He had not long since spent from $2 to $5 per ton for straightening rails after delivery. He reported the cost of this item of labor, and the result was that the next lot came straight.

Mr. L. H. PERKINS: On the matter of unloading he thinks that each individual rail should be carefully taken off and handled.

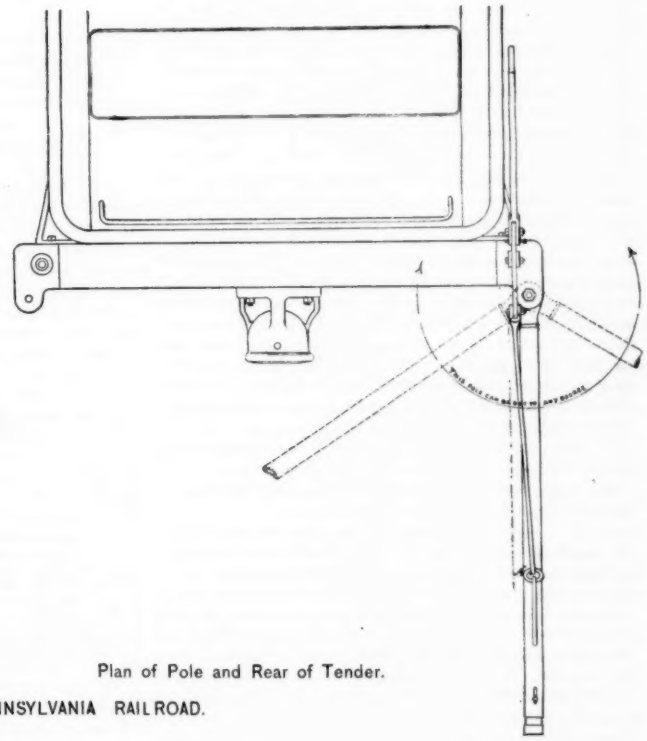
Mr. W. F. ELLIS had occasion to unload a good many cars of rails in the winter. The cars were nearly all with high sides and unloaded from the end. He had made a short roller with a groove large enough to take the foot of the rail. This roller was fixed in a frame, which was placed on the rails in the car. Four men on the car picked up the rail, ran it out on the roller, and it was taken by eight (?) men on the ground and carefully laid out. This involved moving the train forward as each four rails were unloaded.



Details of Push Pole.



Elevation of Pole and Rear of Tender.



Plan of Pole and Rear of Tender.

PUSH POLE FOR YARD ENGINE, PENNSYLVANIA RAILROAD.

Mr. R. HYLAND (Cheshire) piles his rails as he unloads them. He then straightens them and bends those which are to go in curves and runs them out on the track on an iron car. This method may be slow and "old fogy," but Mr. Hyland considers that the good condition in which the rails go into the track makes it worth while. He thinks it proper to straighten all rails, as his rails are not inspected at the mill. A gang of 8 men will handle, straighten or bend 40 or 50 72-lb. rails a day.

On Thursday morning the discussion was continued on the same general topic.

Mr. W. F. CLARK: His rails are laid with broken joints. To check creeping and prevent the joint ties slewing from the carrying forward of one end by the creeping rails he bolts an angle-plate to the middle of each rail, and spikes this to the two ties which are the joint ties of the opposite rail. In this way each rail is held from creeping by four ties. His ties are spaced by the width of the shovel. He has both suspended and supported joints, and sees no difference in maintenance. In 1881 he laid a piece of track ⅛ mile long, with joints alternately supported and suspended, 56 lb. rail. This track is all in good condition, with not a low joint. He had no rail broken at the middle bolt holes.

Mr. ELLIS has become quite convinced that broken joints keep up better than even joints. Comparison of track, laid both ways, but in other respects precisely the same, has shown less low joints marked by the dynagraph car when joints were broken than when they were square.

Mr. LENTELL (Boston & Albany): Rails are laid with broken joints supported, and on grades a plate is used to perform the same service as the angle plate used by Mr. Clark. This is a wrought-iron plate bent to conform to the shape of web and flange of rail. One bolt attaches it to the middle of the rail, and it is spiked to the tie.

Mr. F. C. CLARK (Housatonic): Would use broken, supported joints, with a short angle plate: the flange of the plate to be wide enough to have a hole for the spike instead of a slot. But, after all, the question of joints is subordinate to that of ballast.

Mr. ELLIS brought up the question of adjustment of joints on curves when they are laid broken. He has no 29-ft. rails, and has to cut when it is necessary to use a rail of that length. In laying on a curve, he lets the joint run 6 in. past the middle of the opposite rail, then cuts off one foot. He spoke of the well-known fact that, generally speaking, even joints are preferred on unballasted track, and broken joints on that which is ballasted.

Mr. W. F. CLARK has lately laid 1½ miles of track composed entirely of 6 curves, three to the right and three to the left, about 5°, with no tangent. He cut no rails and came out at the end with the joints within 6 in. of the middle of the opposite rail.

Mr. Perkins, Mr. Stevens and Mr. W. F. Clark agreed that it was practically immaterial whether or not a joint was exactly opposite the middle of the other rail.

The discussion then turned to bending rails before laying.

Mr. G. E. DAGGETT laid an important part of the New York & New England where curves ran to 4½° and did not bend the rails. On these curves he used three rail braces to each rail. He had seen no bad result. He is now using the same practice on the New York, New Haven & Hartford.

Mr. PERKINS thought that if rails are laid with joints square, on curves, the rails should be bent before laying. With broken joints this is not so essential.

Mr. J. W. SHANKS (New London Northern) asked if it were not a fact that with rails laid straight and spiked to the curve they would try to take a straight line as soon as the ties began to get soft. He believes that the rail will try to get straight unless permanently curved.

Mr. DAGGETT had noticed that at joints the tie had been often drawn through, so as to leave the inside spikes of the inner rail standing away from the flange.

It was suggested by several members that braces would obviate this straightening of the rail.

Mr. SHANKS asked why it was not just as important to bend a rail for a 4-degree as for an 8-degree curve, and to this others assented.

In concluding this topic of rails, the Convention adopted resolutions essentially as follows:

The rail should be 4⅛ in. high by 5 in. base and of section to fit the flange of the wheel. [It was doubtless the intention of the resolution to express by this that the upper corner and the fillet should fit, not that the fit should extend down the side of the head.—EDITOR.] There should be no sharp cor-

ners and the top should be flat enough to give 1¼ in. bearing for the tread.

Rails should be bent before laying for all curves of more than 2 deg. They should be bent with some machine that does not make any concussion.

Joints should be suspended and broken.

The Committee on Track Accounts and Forms reported progress and was continued.

WEEDS AND OLD TIES.

The subject of care of the road-bed outside of the rails and of disposition of old ties, etc., was then taken up. The weight of the discussion tended to show that the cheapest way to get rid of old ties is to give them away on the spot, and as that is not often possible, the next best thing to do is to pile them up and burn them. Mr. Ellis considered that every tie loaded for fuel or for sale cost five cents for handling and transportation. Mr. F. C. Clark gave figures showing that 75 cords of ties converted into fuel for the use of the road cost $10 more than the same fuel could have been purchased for. Mr. Perkins, Mr. W. F. Clark and others considered it cheaper to burn ties on the right of way than to attempt to make any use of them. Mr. Patch's ties are burned under stationary engines, and for lighting locomotives, and Mr. Lentell's are mostly made into charcoal or otherwise used as fuel. He thinks they net about three cents each. Mr. Patch pointed out that it costs something to pile and burn ties, and to prevent fire spreading from them; and considered it cheaper to carry them away and give them away than to burn them. Mr. Perkins has found advantage from letting ties lie and rot on slopes of fills. The growth of bushes was promoted, and the slopes kept from washing.

With regard to cutting weeds, it was generally agreed that early in August is the best season, and a resolution was adopted to that effect. Mr. Patch mows the weeds twice—in June and in September—and has got much of his right of way into good grass, which is sold to farmers.

NUT-LOCKS.

The question of nut-locks was next taken up. There was little discussion. The opinion which was generally expressed in the discussion was embodied in a resolution adopted to the effect that it is still the sense of the Association that the Excelsior nut-lock is the best in the market. The only particular mentioned in which it was considered superior to the Verona is the fact that by its size it is less liable to be lost. Mr. Ellis continues the use of the Hoopes & Townsend bolt and nut, with no nut lock, and is satisfied. Mr. Lentell uses the Atwood nut and finds it satisfactory.

ROAD TOOLS.

In the session of Thursday afternoon the subject of road tools was taken up.

Mr. Ellis called attention to the Verona spike puller as one of the most useful tools he has, and Mr. Perkins thought it the nicest little tool he ever saw. The best claw-bar he ever used is made at the Hartford shops of the N. Y., N. H. & H., and Mr. Lane said that a good claw-bar will save as much money in track work as any one tool. It should be light, short enough to go down between the rails, and should have the claw long and thin. Blacksmiths were apt to make the claw too short and stout, to prevent breaking. A tool so clumsy that it cannot be used is pretty sure not to be broken, but it can hardly be economical.

Mr. Ellis showed blue prints of a well designed timber carrier which he had got from the Boston & Albany.

Mr. Perkins uses the Jenne track jack and the Pettibone & Mulliken track drill and likes them.

Mr. J. S. Lane thought that he had been the first to use a rail saw in New England. With the Smith saw he cut five rails with one blade, cutting the fifth in nine minutes.

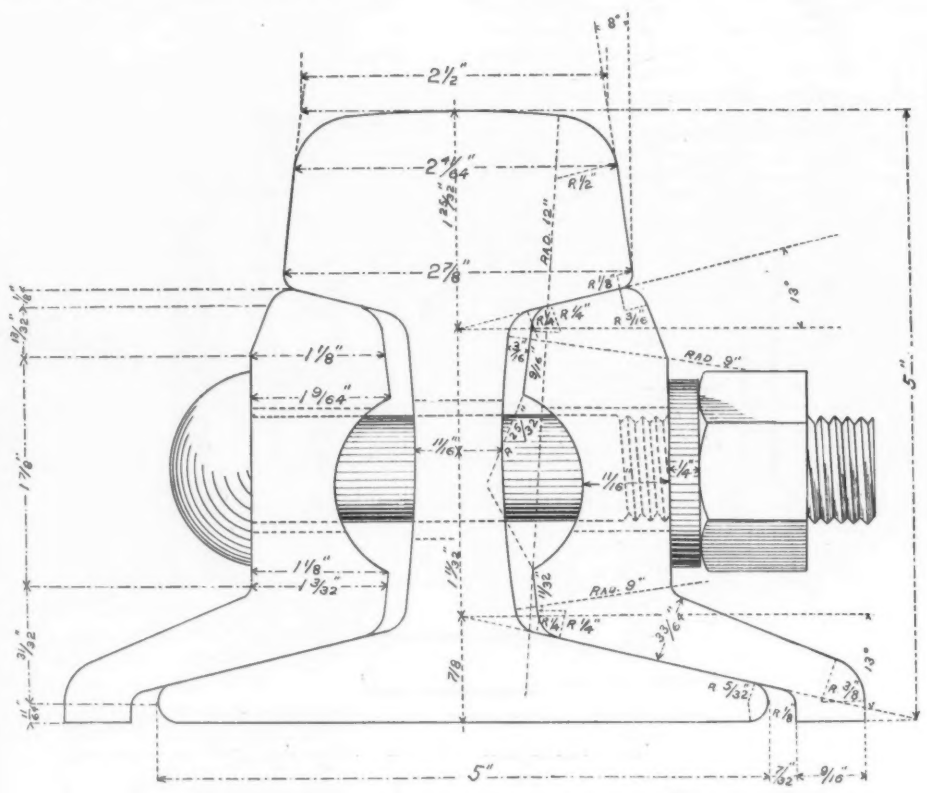
He is going to put down a lot of Servis tie plates for trial. He knows nothing of their value from experience, but the life of his ties is now but four or five years under heavy and fast traffic, and he thinks good results may be obtained from the tie-plate. Mr. G. W. Bishop (Fitchburg) has had the tie-plate in use two years. He put down 1,000 last November. The old ones have turned up somewhat at the ends, but those put down last have not done so. He does not say now that he would adopt them. There is an inconvenience in shimming when they are used.

He has tried the Smith rail saw. He made 12 cuts on 76 lb. rail in 12 to 20 minutes. He thinks that 15 minutes would be about the average.

Mr. Bishop had had three derailments of a hand car on a point switch. The derailments took place at one switch while running down grade, on a curve, at about 10 miles an hour, taking the switch in the trailing direction. The car went off the outside of the curve. Mr. Bishop thought that the tread of the wheels on the inside of the curve followed down the switch rail, which was slightly lower than the stock rail, and by the pressure of the latter against the rim of the wheels, the flanges of those on the outside were forced up on to the rail. He thought that the fault might be with the narrow tread of the hand car wheels. Another member reported a similar derailment. Mr. J. S. Lane has in use 300 split switches from the Pennsylvania Steel Co. and 20 hand cars constantly running. He has never had a derailment of any class of cars at a switch unless the points were thrown under a moving train. He thought there must have been some special defect of switch or car in this case.

A Burnetized birch tie was shown which had been 36 years in the track and was still so hard that the spikes broke when the attempt was made to draw them. This tie has been the property of the Association for some years and has been shipped about to the various meetings. It was voted to make of a part of it a gavel for the use of the President of the Association and to consign the rest of the tie to some place where it can forever rest from its travels.

After the transaction of certain routine business the Association adjourned to the third Wednesday in August, 1889.



90-LB. RAIL—PHILADELPHIA & READING RAILROAD.

(About three-fourths size.)

90-lb. Rail, Philadelphia & Reading.

It has been announced in our news columns that the Philadelphia & Reading is relaying its main line tracks with a 76-lb. rail and that on the New York branch a 90-lb. rail is being laid. We give herewith an illustration of this 90 lb. section and of the angle bars. The uncommonly flat and broad head will be at once noticed, as well as the comparatively light flange. It will be interesting to compare this rail with certain other heavy sections now in use. The 85-lb. section of the Pennsylvania main line was shown in the *Railroad Gazette*, April 6, and the 80-lb. rail of the New York Central & Hudson River March 30 of this year and Jan. 16, 1885. The dimensions compared are as follows:

	Pennsylvania.	New York Central.	Reading.
Weight	85 lbs.	80 lbs.	90 lbs.
Height	5 in.	5 in.	5 in.
Base	5 "	4 13/16 "	5 "
Radius of crown	10 "	12 "	12 "
" upper corner	7/16 "	5/16 "	1/2 "
" lower corner	5/8 "	31/32 "	1 5/8 "
Angle of side	4°	3° (?)	8°
Greatest width of head	2 9/16 in.	2 11/16 in.	2 7/8 in.
Depth of head	1 3/4 "	1 23/32 "	1 23/32 "
Fishing angles	13°	12° 30′	13°
Least thickness of web	17/32 in.	1/2 in.	11/16 in.
Radius of web	8 "	10 "	9 "
Per cent. of total section in head	47	44	49
Per cent. of total section in web	17	19	19
Per cent. of total section in flange	36	37	32

We do not consider the section an ideal one, but it is hardly worth while to go over in detail the reasons why we do not, which are familiar to those specially interested in this subject. This rail is laid with suspended joints, 22 in. between centres of ties. The angle plates have six holes spaced as follows: First, 1 15/16 in. from end of rail; second, 4 in. from first; third, 5 in. from second. The last bolt-hole is therefore over the centre of the tie. The bolts are ⅞ in. diameter and 5⅛ in. long under the head.

The Dill Nut-lock.

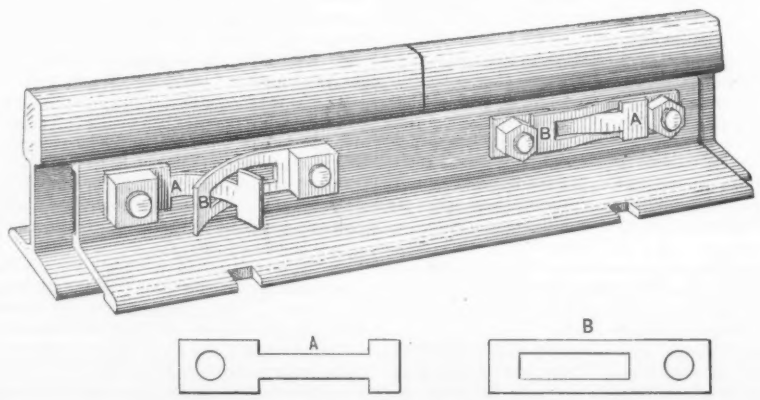
We illustrate herewith a novel form of nut-lock, reported as having been on trial as a rail-joint lock on a number of Western roads for a year or two without a case of failure.

The nuts are locked by means of two strips of sheet iron, *A* and B, about ¼ in. thick and 1 in. wide. At one end of each of these strips is a round hole just large enough to pass one of the two bolts. The other end of the strip is free, and the length of the strips is such that one of these free ends is always in contact with a face of the nut upon the other bolt, which it thus prevents from turning. Strip *B* is of rectangular shape and has a slot about ⅝ in. wide, through which passes up the narrow middle part of strip *A*, which is made T-shaped at its free end in order to have a broad bearing surface against its nut.

In the perspective view the strips are shown bent up as by a nick, etc., in order to permit of the turning of the nuts, as when they are driven home in the first place or when the joint is to be removed. A blow from a hammer brings the strips down into their proper place, locking both nuts, as shown in the farther pair of bolts.

We understand that these washers can be furnished at about $10 per thousand pairs by the patentee, J. F. Dill, Ridgway, Pa.

Three nuts can be locked in the same way by using longer strips.

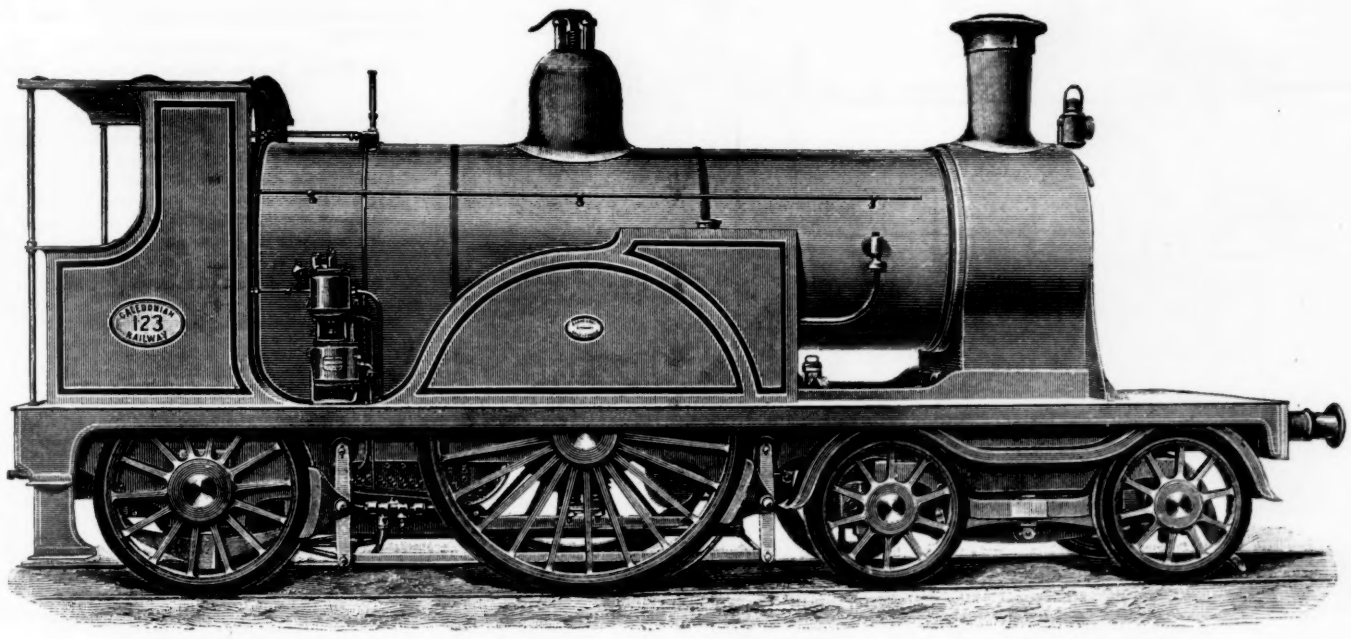


THE DILL NUT-LOCK.

The Erie Accidents.

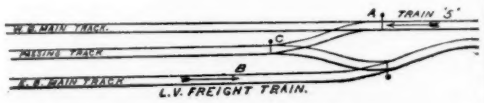
We have received the following details of the two recent accidents on the Erie from an officer of that road. They do not modify what we said last week on this subject, but confirm the idea that both those accidents were of a sort that could have been prevented only by something a good deal better than ordinary practice.

"As to the accident to train 5, near Corning: The derail-



EXPRESS LOCOMOTIVE, CALEDONIAN RAILWAY.

ment was caused by an open switch, which was a facing point switch to a middle passing siding. We have, as yet, been unable to definitely determine whether the switch was opened maliciously or opened by mistake by one of the trainmen of an east-bound freight train, which had just pulled out of the middle siding. The night was very dark and it was raining very hard at the time. The train was hardly making its schedule time, which is about 38 miles per hour. The switch that was turned wrong was equipped with a high switch stand, and the switch light was burning brightly. The engine was of the Wootten type, and the fireman was at his post busily engaged fixing his fire (you are undoubtedly aware how the Wootten engines are constructed). We are unable to say whether the engineer discovered the switch wrong before the engine left the track (he was killed), but the switch light could be plainly seen for a distance of at least 2,000 ft. The engine left the track at the entering switch to the middle siding and tipped over on its side, in doing so struck a Lehigh Valley engine which was on a passing east-bound freight train at the time, damaging the Lehigh Valley engine to the extent of about $200 or $250 and slightly injuring the Lehigh Valley engineer. The switch in the middle siding where the engine left the track, you will understand, was turned so as to enable the east-bound freight train that had taken the switch there to pass from the middle siding to the eastward main track. In this position, of course, it would be set wrong for westward bound train to enter the siding. See sketch attached, which will enable you to more readily comprehend the situation.



A—Train 5 left main train; high signal.
B— " 5 struck Lehigh Valley engine.
C— " 5 derailed.

"As to the accident at Shohola: A slide came down on the eastward track, just ahead of an east-bound freight train. About an hour before the slide occurred a severe rain and wind storm set in, one of the severest known in that section for years. The night was very dark, and when the freight train ran into the slide the engine and four cars were derailed, blocking both the eastward and westward main tracks. The freight train was derailed about the time train 3 was due. By the collision of the freight train with the slide all the freight train lights were extinguished. The engineer and fireman of the freight train were injured, and the head brakeman was entangled in the wreck. As soon as he could free himself, his first thought was to try and save train 3. (The storm was then at its height.) He lost his lanterns in the wreck, and the only one he could get was a switch light, which was burning brightly on a switch near by. He started out with this, but only went a short distance when he heard train 3 close at hand, and then to his horror he discovered that the switch light had also been extinguished; the result you already know. Train 3 was making its schedule time, about 35 miles per hour. When it ran into the obstruction the engine, mail car, Chicago & Atlantic baggage car, loaded with racing horses, smoker and one day coach, went over the embankment, about 80 ft. from the main track. Our conclusions are that the fire was started from the stockmen's lanterns and the hay. The very fortunate results to the passengers in the cars that went down the embankment can only be attributed to the very strong construction of the coaches; although they went over an embankment 80 ft. high, when they landed at the bottom both the coaches were intact, and in comparatively good condition. In the construction of our equipment, both engines and cars, the greatest care is taken, and nothing is left undone to secure not only comfort but also in cases of derailment or accidents of any kind the greatest possible protection against injury to the occupants. That this is a wise policy to pursue has been clearly demonstrated in the recent derailment of train 3. About twenty minutes before the freight train ran into the slide the rock gang, consisting of a foreman and six men (whose duty it is to patrol the line on the division and see that there are no obstructions on the track or likely to come down on the track), passed the point where the slide came on the track, and everything was clear and there were no indications of a slide."

Express Locomotive, Caledonian Railway.

The extraordinary speed developed in the race between the competing Scotch expresses naturally arouses some interest as to the locomotives employed. The large variety of types of engines used for fast passenger traffic in England has been often touched upon in these columns. The East Coast route appear to have employed the Great Northern 8-ft. single drivers and the Northeastern Mr. Worsdell's four-coupled compounds with 80-in. drivers and one high pressure cylinder 18 in. dia. and one low pressure 26 in. dia., both having 24-in. stroke. The West Coast route made the remarkable run of 158 miles without a stop in 2 hrs. 58 min., with a light single driver engine, the Marmion, built in 1863. The fastest work, however, appears to have been done on the severe gradients further north, and with our present information, the honors are divided between the engine illustrated and a locomotive (probably one of Mr. Webb's compounds) which ran from Preston to Carlisle, 90 miles, in 90 minutes. The line has a net rise of 907 ft. in 30 miles, and the worst grade is 70 ft. per mile for 4¼ miles. An average speed of 60 miles an hour over such gradients is a very remarkable performance.

The accompanying illustration represents the locomotive which ran from Carlisle to Edinburgh, 101 miles, in 104 minutes. Somewhat higher speeds have been attained on the Canada Southern and other approximately level lines, but this performance is noticeable from the speed attained in spite of long and heavy gradients. The principal summit is just 1,000 ft. above Carlisle, and the principal grade is 10 miles long, averaging 66 ft. per mile. The engine tender and train are stated to have weighed about 348,000 lbs.

The engine is inside connected, with a single pair of large drivers, and a side motion truck under the front end. Sand can be blown on the rails immediately under the drivers by means of a jet of air, and it is found that this method prevents slipping in wet and windy weather, when sand delivered in the ordinary manner is often blown to one side.

The Adams vortex or annular blast pipe is used, giving a more even and efficient draft on the fire and improving the steaming of the engine. No spark-arresting device is found necessary.

The frames are made of steel plates 1 in. thick, and the axle boxes are of solid brass. The boiler shell is of iron, the barrel being made in two plates only, the longtudinal seams having double butt straps, while the circumferential seams are lap joints. The inside fire-box is made of copper, the crown being arched and secured to the outside fire-box by bolts, which are not rigidly screwed into the outer casing, but rest on sling stays so as to permit the inside box to rise when expanded by heat.

Six stays, 1⅝ in. dia., are used between the two tube sheets. This precaution is somewhat unusual in locomotive practice, though general in marine boilers.*

The water gauges and other fittings are made of a new alloy, "arguzoid," of a silvery color.

*Boilers stayed in this method are illustrated in Plates 418 to 423 *Recent Locomotives.* Enlarged Edition.

The principal dimensions of the engine and tender are as follows:

Cylinders, diameter and stroke	18 × 26 in.
Driving wheels, diameter	84 in.
Truck " "	42 in.
Trailing " "	54 in.
Engine wheel base	21 ft. 1 in.
Engine and tender wheel base	42 ft. 6 in.
Heating surface, fire-box	112 sq. ft.
" " tubes	973 "
Heating surface, total	1,085 sq. ft.
Grate area	17.4 sq. ft.
Tender, gallons (8½ lbs.)	3,325
" wheels, number and diameter	six 48 in.
" wheel base	13 ft.
Weight in working order:	Lbs.
Truck	30,240
Drivers	38,080
Trailing	25,576
Total, engine	93,856
Tender, full coal and water	75,040
	168,896
Tractive force per pound average pressure on pistons	100

This engine was designed by Mr. D. Drummond Locomotive Superintendent of the Caledonian, and was built by Neilson & Co., Glasgow. The engine was exhibited at the Edinburgh Exhibition in 1886 and was much admired for its fine workmanship.

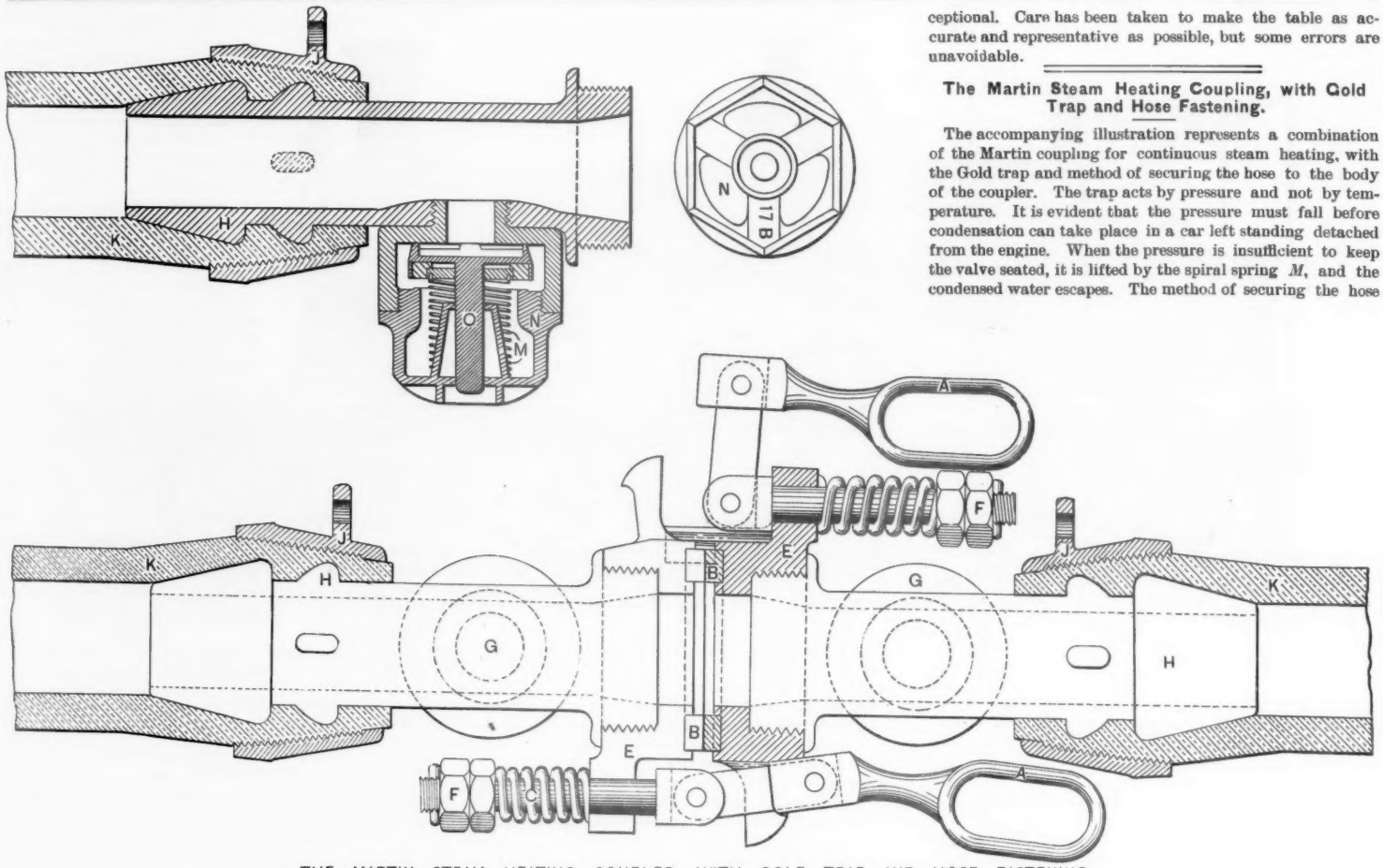
It will be noticed that this long run without a stop was made with a tender tank not exceeding the usual size. As the tank held when full only 3,325 gallons of water, the highest possible average consumption per mile would be about 31.5 gallons, or 270 lbs. of water. The maximum consumption of coal, allowing an evaporation of 9 lbs. per pound of water, would amount to 30 lbs. of coal per mile, while at 8 lbs. of water per pound of coal the consumption would be only 34 lbs. per mile. It would therefore appear tolerably certain that this great speed was attained at a moderate consumption of coal and steam, and, indeed, the mere fact that an engine with an ordinary tender can run 101 miles without taking water shows an unusual degree of economy.

Mr. Arthur on the C., B. & Q. Strike.

Chief Arthur, in his address at the reunion of the locomotive engineers in Detroit, said:

On all the railroads we have grievance committees. If any difficulty arises it is the duty of the committee to wait on each officer of the road from say the master-mechanic to the president. If no adjustment is secured, the chief executive of the order must be sent for, and he must take every honorable means to settle the difficulty. In this way we settled every case that has arisen in the past eleven years, until we came to General Manager Stone and Mr. Burleigh, of the "Q" road. We did not get all that we asked in each of these cases, but we bettered the condition of the men. I believe that where 10 per cent. increase is asked for, it is better for the men to take 5 per cent. than to strike. I don't believe in the "whole hog or none" principle. Employers have rights as well as employés. In these cases we made contracts which bound the roads to their agreements.

A year before the "Q" difficulty, we made a settlement with Mr. Potter, of the "Q." On the "Q" line men were receiving about $1 per day less than men on parallel lines, as, for instance, the Chicago & Northwestern, from Chicago to Galesburg, paid $4.37, the "Q," $3.75. The men finally came together. They formulated a schedule. There were some things in the schedule that looked unreasonable on their face. The men are not lawyers, you know, and didn't know how to place things properly. Mr. Stone printed and spread broadcast over the country the schedule in its worst light and poisoned the minds of the public. The brotherhood wanted the schedule recognized and their families carried free. Mr. Stone refused to grant anything, or to hear the men. I was summoned, and the entire force of officers, with the exception of President Perkins of the road, were present. We took up the first proposition presented by the men. It was that the men be given a fair and impartial hearing before being discharged. That was laid aside temporarily. We only asked that where charges were preferred the men be not discharged without a hearing. We then took up the next proposition, for pay during delayed time. We claimed that if we were delayed for over two hours through no fault of our own that we should be given compensation. Mr. Stone submitted a proposition in lieu of this; we accepted it and then he imme-



THE MARTIN STEAM HEATING COUPLER, WITH GOLD TRAP AND HOSE FASTENING.

diately withdrew it. The men wanted 3.5 cents per mile on four-wheeled engines and 3.8 cents on eight-wheeled. Stone objected and I agreed to make it 3.5 cents on all engines. I showed him that this was the standard price through the country. He would not grant this, even. Then I said, this being the sticking point, if the men on your road strike, I will sanction it. But we decided to make another effort. We tried to reach President Perkins, who was in Boston, and telegraphed him plainly stating the status. He would not answer definitely. He would return to Chicago next week, he said. Had he asked us to wait until his return we would have waited. The men had all along wanted to strike. Monday morning at 4 o'clock was the time at which the men could stop with least trouble to the road. We notified Mr. Stone of their determination to go out then, if no concessions were made. He said go ahead, and at 4 o'clock all but one crew between Chicago and the Rocky Mountains quit work. As a business proposition, where did the good judgment come in? They paid their new men $4 per day and board. No one but an insane man would act as Stone did. Have they now a better class of men? Thieves and drunkards are among their employés. Of those who struck, some were tried and trusted employés before Stone wore pantaloons.

We discountenance all acts of violence. We condemn everything dishonorable. My advice to the men has been to be men. I never will, God being my helper, countenance anything that will bring disgrace or dishonor on our brotherhood. When you depart from this you may date the downfall of our order.

Speed of Passenger Trains.

The accompanying table gives the speed of the fastest passenger trains and the average speed of all passenger trains between most of the principal cities of the United States. The times and distances are taken from the *Traveler's Official Guide* for July, 1888. The average distance between the stations at which the fastest train is timed to stop is also given where possible. The time on which the speed is calculated includes all stoppages, and no allowance or deduction is made for ferries, etc. It is believed that in every train given in the table, through cars of some description are run between the termini given, though in some cases no sleepers are run, and in others the sleepers only are run through.

The trains given in the table either run between or pass through 36 of the principal cities in the United States, and it is believed that Denver and Indianapolis are the only important omissions. The case of Brooklyn is of course exceptional. Care has been taken to make the table as accurate and representative as possible, but some errors are unavoidable.

SPEED OF PASSENGER TRAINS BETWEEN PRINCIPAL CITIES, JULY, 1888.

WHENCE—WHITHER.	ROUTE.	FASTEST TRAIN. Distance. Miles.	Time. Hrs. Min.	Speed. Miles per hour.	Average distance between stopping stations. Miles.	No. of trains each way per day.	Average speed of all trains.
New York—Philadelphia..	Philadelphia & Reading. . .	90 4	2 9	42.0	12 9	10	32.6
" "	Pennsylvania..... ...	90.8	2 5	43.6	22.7	23	34.5
" —Washington.. ..	"	226	5 32	40.8	?	9	34.5
" —Pitt-burgh	"	444	11 30	38.6	89	4	31.6
" —Chicago	"	912	25 0	36.5	102	4	29.9
" "	N. Y. Central & Lake Shore.	981	25 0	39.1	109	4	32 7
" "	" & Mich. Central.	977	28 30	34.3	28.7	3	30.9
" —Buffalo.....	New York Central	441	10 45	41.0	110	5	34.8
" "	Erie	423	13 0	32.5	21	3	31.3
" "	Lackawanna	409	12 40	32.3	16	2	29.9
" —Boston	Boston & Albany	234	6 0	39.0	33 5	4	35.4
" "	New York & New England..	213	6 0	35.5	53	5	31.1
" "	Shore Line	229	6 0	38.2	32.7	4	32.7
Baltimore—Chicago	Baltimore & Ohio.....	853	25 40	33.2	25	*2	29.5
" "	Pennsylvania	801	23 15	34.4	33	4	28.5
Chicago—Minneapolis.	C., M. & St. Paul.....	420	14 40	28.6	15.0	3	27 0
" "	C. & Northwe-tern.....	419	14 33	28.8	18.0	2	27.5
" "	Wisconsin Central.	472	15 5	31.3	26.0	2	28.7
" "	C., St. Paul & Kansas City..	431	15 0	28.7	22.7	2	26.8
" "	C., Burlington & Northern..	442	14 37	30.2	19	2	28.3
" —Kansas City . . .	C., Burlington & Quincy ...	487	15 40	31.1	24.3	2	26.3
" "	Chicago & Alton	488	15 30	31.5	30.5	3	25.0
" "	C., Rock Island & Pacific ..	521	16 35	31.5	....	2	27.3
" "	C., Santa Fé & California...	458	20 25	22.4	24.1	2	21.7
" —Omaha	C., Burlington & Quincy....	508	16 20	31.1	30	3	28.5
" "	C., Milwaukee & St. Paul,...	490	18 45	26.1	9.4	2	25.0
" " .....†	C., Rock Island & Pacific ...	500	16 0	31.2	18.5	3	26.5
" —St. Louis.....	Chicago & Alton	283	10 35	26.7	?	3	26.1
" "	Wabash	286	9 50	29.1	8	2	28.2
" "	Illinois Central.....	299	10 30	28.5	?	2	28.0
" —New Orleans ...	" "	915	35 0	26.1	10	2	25.0
Cincinnati— "	Cin.. N. O. & Texas Pacific.	826	25 35	32.3	59	2	27.5
Louisville— "	Louisville & Nashville	811	25 0	32.4	25.3	2	29.0
Savannah—Atlanta..... ...	Central of Georgia.....	295	10 20	28.5	10.5	2	28.3
St. Louis—Galveston.....	Missouri Pacific	1014	46 55	21.4	10.4	1	21.4
" "	Iron Mountain	869	35 55	24.2	13.6	1	24.2
Omaha—Ogden	Union Pacific	1031	36 10	28.5	38	2	24.7
Ogden—San Fra cisco.....	Central Pacific.....	834	37 45	22.9	12	2	21 5
San Francisco—N. Orleans..	Southern Pacific	2495	113 25	22.0	?	1	22.0
St. Paul—Portland	Northern Pacific	1913	74 20	25.7	31	2	22.8

* Via different routes. † To Council Bluffs Transfer.

The Martin Steam Heating Coupling, with Gold Trap and Hose Fastening.

The accompanying illustration represents a combination of the Martin coupling for continuous steam heating, with the Gold trap and method of securing the hose to the body of the coupler. The trap acts by pressure and not by temperature. It is evident that the pressure must fall before condensation can take place in a car left standing detached from the engine. When the pressure is insufficient to keep the valve seated, it is lifted by the spiral spring *M*, and the condensed water escapes. The method of securing the hose has been previously described in these columns. The taper nut is screwed direct on the rubber hose, and forces it into direct contact with projecting lugs on the nipple of the coupling. This fastening appears to be very secure, and the tendency of the screw-thread to cut the rubber is not apparent in couplings that have been in use for some time.

The construction of the Martin coupler is so well known and is so clearly shown in the drawing that no further description is necessary.

The names of the various parts are given below:

A. Lever handle.
B. Disk.
C. Spring.
E. Disk-holder.
F. Lock nut.
G. Vacuum relief trap.
H. 1½ in. hose, nipple attachment.
J. 1⅓ in. hose collar.
K. 1½ in. six-ply steam hose.
L. Trap cage.
M. Spiral spring.
N. Body of trap and valve seat.
O. Spindle valve.

Stanwood's Car Steps.

We illustrate herewith a novel method of constructing the steps of passenger cars, which though only quite recently devised, is already meeting with much favor among car builders. Casual examination of the illustrations may probably reveal no more than that the steps are perforated, which is a well-known device in steps of buildings, carriages and similar structures. In such construction, however, it has been customary to form the perforations either in castings, or by making the tread of a series of paralleled wrought iron bars of considerable thickness. For various reasons, which will be named below, Mr. Stanwood has made a radical departure from these methods of construction, in that he forms the steps of very thin blades of steel, crossing each other at right angles, or nearly so, and forming a tesselated surface or tread. The actual area of metal on which the foot rests when stepping on such a surface is extremely small, nearly the entire area consisting of open spaces, bounded by smooth, vertical walls, which offer no resistance to the free passage of dirt, water, snow, etc., through the step. Moreover, the thin edge of the blades, crossing each other at right angles, as they do, render it absolutely impossible for the foot to slip, for the metal strips are so thin that no matter how much they may be worn they expose an edge sharp enough to slightly indent the sole of the boot and hold it firmly. In this way the step prevents slipping in any direction, prevents the accumulation of ice, dirt, or snow, which would otherwise tend to cause slipping, and is in itself a very efficient foot scraper to remove ice or dirt from the boot, thereby conducing to cleanliness of the cars themselves, as well as of their steps. The strips forming the tread of these steps are of Bessemer steel, No. 20 gauge, and usually seven-eighths of an inch deep. They are surrounded and bound together by a channel iron frame, and are generally supplied with a cap of malleable iron at each end, through which bolts pass to fasten the step to the step hanger. The thin material used for the strips enables the

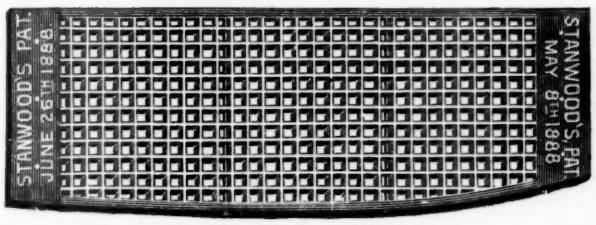


Fig. 2.

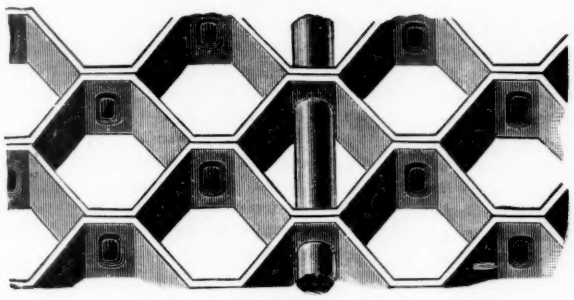


Fig. 3.

Fig. 1.

STANWOOD'S CAR STEPS.

steps to be made quite light, and the fact that special machinery has been built for their rapid manufacture enables them to be sold at prices well within the reach of builders, notwithstanding that they have an expensive appearance.

Fig. 1 shows the step as applied to passenger coaches. Figs. 2 and 3 illustrate two forms of arranging the metal strips. In the construction of fig. 2 the strips are halved together at points of intersection, which is done by cutting slits half across the strips, and of the same width as the thickness of the metal of the strips. In the construction of fig. 3 the strips are "crimped" in such way that the spaces are hexagonal in shape. Corresponding bosses and cavities are also formed on the surfaces of the strips where they come in contact with each other, which hold the strips against vertical sliding on each other after they have been bound in the step frame. The surface of these steps is quite as comfortable to walk on as that of any floor, is practically indestructible by wear, is self-cleaning and absolutely non-slipping.

These facts render this surface peculiarly suitable for the steps of cars, especially during freezing weather.

Other information may be obtained from the manufacturer, Mr. F. H. Stanwood, Phenix Building, Chicago, or from Messrs. Pugh & Russell, Stewart Building, New York, who are selling agents for the street-car step.

THE SCRAP HEAP.

Live Stock Buffet Cars.

The Texas *Live Stock Journal* says that two trains of the same lot of cattle were shipped, one train load in common stock cars and one in the Street buffet cars. On arrival at Chicago it was found that those in the common cars averaged 858 lbs. and sold for $3.20 per 100 lbs, while those in the buffet cars averaged 908 lbs. and sold for $3.40 per 100 lbs. The freight of the buffet cars was 50 cents per head more than in the other cars, still leaving a balance of $2.92 per head in their favor, amounting to $70 per car.

Perhaps some of the New England roads that are trying to run "buffet" cars on their fast passenger trains will try this contrivance of Street's. It could not be much worse than an ill-mannered darkey making sandwiches by the water-closet, and washing dishes in the hand basin.

Comfort for the Ticket Agents.

Ticket agents on the Baltimore & Ohio have received from the Wisconsin Central passenger department circulars reading as follows: "I am just in receipt of advice from your general ticket agent that the Baltimore & Ohio has waived the conditions of Circular Letter A, dated March 16, 1887, and hasten to notify you therefore that we will be glad to receive your vouchers regularly hereafter, and that if you will make up a statement of sales since April 1, 1887, we will without delay remit you on the basis at present in force."

Employes' Excursion on the Central of Georgia.

The Central managers are undoubtedly popular with their employés, and there is good reason for such a feeling. This company yesterday tendered their employés at Macon a free excursion to the Piedmont Chautauqua, running a solid train through from that city to Salt Springs.—*Exchange.*

Fine Cars for the Piedmont Air Line.

The Piedmont Air Line has lately received at Washington the first of a number of remarkably handsome Pullman cars, which are to be run in through service between Washington and New Orleans. They are vestibuled buffet sleepers, with the latest novelties and improvements in construction and in finish. From the description of the car just delivered it would appear that there is nothing more luxurious or more complete in the country. It has a stateroom and two sections arranged to be curtained off from the rest of the car, two toilet rooms for ladies, and an unusually large smoking room. The wood work is mahogany, and the upholstery pale blue plush except in the smoking room, which is oak with olive green upholstery.

The water is supplied from tanks under the car by air pressure. There are hot and cold water faucets to each basin, and the drinking water is taken from a spouting faucet very suggestive of a soda water fountain. The closets are flushed with an abundant supply of water. The water for drinking is cooled by ice which is not melted into the water, but cools it by contact with the pipes only. In the same way the hot water faucets are fed by pipes passing around the heater and thence into the reservoir. The air pressure is derived from the air brakes of the train. This appliance also makes practicable its utilization for protection against fire, and there are a stand pipe and hose in both ends of the car, with pressure sufficient at either end to throw a stream the entire length of the car.

TECHNICAL.

Locomotive Building.

The New York Locomotive Works, of Rome, N. Y., has just completed two new freight locomotives for the San Antonio & Aransas Pass road.

Four new locomotives recently completed at the Altoona shops of the Pennsylvania were put into service on the eastern division this week.

The Rogers Locomotive Works, of Paterson, N. J., this week delivered four new locomotives to the Brunswick & Western.

The Baldwin Locomotive Works has completed two passenger locomotives for the Georgia Southern & Florida.

The Rhode Island Locomotive Works last week shipped six ten-wheeled freight locomotives to the Kansas City, Memphis & Birmingham. They are bituminous burners with 55 in. drivers. The total weight of the engines is 108,000 lbs., with 78,000 lbs. on the drivers. The boilers are of wagon-top pattern of half inch Otis steel. There are 200 2-in. tubes 11 ft. 9 in. long. The fire-box is 78 × 35 in. The cylinders are 18 in. × 24 in.; Morse balance valves with extra wide balancing plates and a single exhaust nozzle are used. The engines are equipped with a variable exhaust damper, the device of H. A. Luttgens, of Paterson, N. J.

There are now being constructed in the Canadian Pacific shops at Hochelaga, Que., 40 locomotives for the Rocky Mountain division. The cylinders are 18 in. by 22 in., and the steam pressure will be 180 lbs.

Car Notes.

The Kansas City Car & Wheel Co., Kansas City, Mo., is now at work on the following orders: 100 coal cars for the Kansas City, Fort Scott & Gulf; 150 ore cars for the Union Pacific, after a patent specially designed for that company, and for which patent has been applied for; 10 box cars and 10 stock cars for the Kansas City & Southern; 6 Van Wermer dump cars for the Arizona & New Mexico. Besides these orders for new cars the company has in hand the repainting and repairing of 240 refrigerator cars belonging to the Fowler, Armour and other packing companies; also an order to repair and repaint 200 cars for the Kansas City, Ft. Scott & Gulf. The Kansas City Belt line has placed the repairing of their rolling stock in this company's hands. A. T. Buchanan, of Kansas City, is the General Manager. The company is employing 250 men and will soon engage 150 more.

The Ohio Falls Car Co., of Jeffersonville, Ind., has recently completed 30 new platform and 20 new box cars for the Georgia Southern & Florida, and four new passenger cars for the New York, Susquehanna & Western.

Twenty new platform cars were completed last week at the Anniston shops of the United States Rolling Stock Co., for the Alabama Great Southern.

The Elliot Car Works, of Gadsden, Ala., this week completed 30 new platform cars for the New Orleans and Northeastern.

The Empire Car Works of Schall & King, of York, Pa., recently completed a number of new passenger cars for the Cumberland & Pennsylvania road.

James Harris & Co., of St. John, N. B., recently delivered 21 cars to the Nova Scotia Central.

The Harlan & Hollingsworth Co., of Wilmington, Del., is building two new Mann boudoir cars for use on the Georgia Pacific.

The Litchfield Car & Machine Co., of Litchfield, Ill., recently completed a number of new refrigerator cars for the Louisville & Nashville.

The Cincinnati, Sandusky & Cleveland has let a contract for the building of 200 box cars to the Terre Haute Car & Mfg. Co., of Terre Haute, Ind. The cars are to be equipped with the Wagner car door.

The Louisville, New Orleans & Texas will soon let the contract for constructing a number of new freight cars.

The Barney-Smith Co., of Dayton, O., this week shipped 20 box cars to the Southern Pacific.

The Indianapolis Car & Manufacturing Co. is completing 25 freight cars a day for the Atchison, Topeka & Santa Fe.

The Harlan & Hollingsworth Co. has also just completed, for the New York, New Haven & Hartford, six new sleeping cars, to be run on the night express between New York and Boston.

Bridge Notes.

The County Commissioners have let the contract for building the superstructure of an iron combination bridge on Elston avenue, Cincinnati, O., to the Queen City Bridge Works.

The Kansas City, Memphis & Birmingham will erect an iron bridge, 150 ft. long, over the Buttahatchie River, on the branch to Columbus, Miss.

The contract for building the four span bridge across the Ocmulgee River at Macon, Ga., for the Central of Georgia, has been let to the Atlanta Bridge & Axle Co., of Atlanta, Ga. The company has recently completed the following bridges for the Central of Georgia system: Draw and fixed span, over the Columbia River, on the Blakely extension; five span, across the Chattahoochie, at Columbus; one span, over Walnut Creek, at Macon; one span, over Courkee Creek, on the southwestern division.

The bridge to be built by the counties of Hampden and Hampshire, at Holyoke, Mass., which we noted two weeks ago, will consist of 10 spans of about 160 ft. each, with a total width, inside of hand rails, of 46 ft., and with trusses spaced 32 ft. apart on centres. Bids will be received for either pin connected or riveted lattice trusses. Plans and specifications can be had of Edward S. Shaw, 5 Pemberton Square, Boston, and proposals are to be sent to Leonard Clark, Springfield, Mass., before Sept. 5.

An iron bridge is to be erected at Newton, Mass., by the city council.

Two new steel swing bridges over the Chicago River in the heart of the city of Chicago are about completed. One is at Eighteenth street and one at Wells street. Both were erected by the Keystone Bridge Co. The Eighteenth street bridge cost $83,300 and the Wells street bridge cost $59,000. The latter is one of the finest bridges on the river. It has a double roadway and is 220 ft. long. The bridge was built by the North Chicago City Railway Co.

Proposals are asked until Aug. 31 for the iron superstructure for a bridge over the St. Francis River at Sherbrooke, Can., to be built by the Quebec Central Railroad Co.

J. T. Thomas, Grenada, Miss., will receive proposals until Sept. 3 for building three iron bridges in Grenada County.

The Memphis & Charleston and the Louisville & Nashville companies will construct a steel draw bridge across the Tennessee River, at Sheffield, to be owned and used by the two roads.

The Boston & Maine has petitioned the Harbor and Land Commissioners of Boston for authority to rebuild all the bridges of its line, including the Boston & Maine, Eastern and Boston & Lowell roads, over Charles River.

Vestibuled Trains on the Baltimore & Ohio.

The first of the Baltimore & Ohio Co.'s new vestibuled trains has been turned out of Mount Clare shops, and an experimental trip has been made with it. The train was run from Baltimore to Keyser, 215 miles, in five hours, over some of the sharpest curves on the road; but, notwithstanding the high speed maintained, the swaying of the train was scarcely perceptible. The new train will be immediately placed in regular service between Philadelphia and Chicago. All other through trains on the B. & O. will be fitted with the vestibule appliance as rapidly as possible, and, within the next 60 days, it is thought to have the work completed.

RAILROAD GAZETTE

Published Every Friday,
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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The revised Rules of Interchange have just been issued, and come into effect on Sept. 1. The principal additions to the rules are the very clear and definite instructions as to defects in brake-rigging and draw-gear. The method of using the wheel defect gauge is shown by diagrams, which will be useful to many car-inspectors. The rules appear to give general satisfaction, for they are adopted by 138 railroads, and the amendments at the last M. C. B. Convention amounted to little more than increasing by ¼ in. the safe limit of the diameter of car-journals, which must now measure at least 3¾ in. for a 60,000-lb. car. A continuous brake is also recognized for the first time as part of the ordinary equipment of a freight-car, and "air-brake hose lost or injured" is included among the defects for which cars may be refused.

The report of the meeting of the New England Roadmasters' Association, which is concluded in this issue, will be read with interest by higher officers, for it indicates the conscientiousness with which the members study the details of their business. The Association is a small one, but probably a third of the total membership was at the convention, and the long sessions were well attended. The members met for business, and were not diverted from their purpose. Among the resolutions adopted that recommending 72 lbs. per yard as the least weight for rails is the most significant, and it is to be noted that most of those who spoke on the subject were in favor of even a heavier section. The Roadmasters' Association of America recommended, it will be remembered, a minimum weight of 60 lbs. The difference in this particular in the ideas of the two associations is probably a matter of geography. The larger society includes a great number of members from the South and West who are accustomed to thin traffic and light roads. It is quite possible that if they were to take action again this fall they would recommend a heavier rail.

The decision of the Inter-state Commerce Commission in the case of The Lincoln Board of Trade *vs.* The Missouri Pacific Railway Co. shows two things: first, that the Commissioners have undertaken to regulate the relative rates to points on different branches of the same line, and, second, that they realize the necessity of caution in exercising this authority. The state of facts is as follows: The Missouri Pacific Railway makes somewhat lower rates between St. Louis and Omaha than between St. Louis and Lincoln, although the distance is a trifle greater. But the Omaha rate is a competitive one, while the Lincoln rate is not. Moreover the Wabash line, which competes for the St. Louis-Omaha business, is somewhat shorter than any line from St. Louis to Lincoln. And, finally, the differential between the Omaha and Lincoln business which goes to Chicago is clearly justified by the relative position of the two places; and the St. Louis differential simply follows the Chicago differential. Under the circumstances the Commission holds that the Lincoln Board of Trade have no good ground of complaint. We agree with their conclusions; we are only surprised that they should feel it necessary to argue the matter out at so much length. The attempt to adjust the relative rates on different branches of a road is a difficult one; and it was a grave question whether it properly belonged within the duties of the Commission. The short-haul clause, by mentioning specifically cases where the "shorter was included within the longer" distance, seemed to imply that the distance principle was not to be decisive in cases where there was no such inclusion. We believe that the Commission would have done, on the whole, more wisely to decline to take jurisdiction on this general ground rather than to enter into an elaborate examination of this special case.

The case of the Burlington dividend is a little peculiar. There seems to be no pretense that the quarterly dividend of 1 per cent. has been earned during the period in question. But the law of several New England states forbids the investment of certain classes of funds in the securities of roads which have not paid dividends continuously for a certain term of years. Passing a single dividend would thus have an effect in depressing the value of the securities of the company, wholly out of proportion to all just cause, and would greatly embarrass the company in its future efforts to borrow money.

We see that the directors had some good motives for their action, and that it was probably in the interest of the property which they represent. But we cannot agree that this makes it right. Dividends are supposed to be paid out of current earnings. The law in this respect is less clear in America than it is in England, where several cases bearing on precisely this point have recently been decided; but there can be no doubt that in the absence of special circumstances which justify it, the declaration of an unearned dividend would be considered wrong. Do the circumstances justify it in this particular case? We think not. What is relied upon as a justification from one point of view only increases the illegality in another. Certain states demand that trust funds should be invested only in the bonds of roads which have paid continuous dividends. It is easy to see the reason for this provision. Railroad property which is subject to fluctuations is, as a rule, an unwise investment for funds of this character. To such a fluctuation the Burlington has recently been subject. The directors believe, no doubt honestly, that their road is an exception to the general rule on which the law is based. They therefore evade it by paying a dividend which has not been earned during the period in question. In other words, they violate one rule of law with the avowed intention and express purpose of evading another. They think that their case constitutes an exception, and take the law into their own hands. But "the law is such a fragile thing that when a man takes it into his own hands he is apt to break it."

The Railroad Officers' Association.

The President of the Roadmasters' Association of America, in a letter which we print in another column revives the subject of co-operation between the different associations of railroad officers. The immediate occasion of his letter is one to him from the President of the Superintendents' Association, forwarding drawings of solid and spring-rail frogs which were adopted as standard at the spring meeting of the superintendents. The President of the Superintendents' Association thinks that this matter should have been first acted on by the Roadmasters' Association, then by the superintendents, and finally by the general managers, through the Time Convention. He hopes, however, to get an expression now from the roadmasters and to forward the whole subject to the Time Convention for what should be final action, so far as the associations are concerned. This is an example of practical co-operation between the associations, but it will be seen that it is not in pursuance of any routine, or customary proceedure, but is the result of the active interest of one or two men in getting complete and harmonious action on an important detail.

The incident suggests again the desirability of establishing some fixed relations between the associations, such that matters will be taken up and acted upon by them in the order of their rank. One correspondent of the *Railroad Gazette* suggested last October that subjects of discussion, originating with the master car-builders, the master mechanics, or the roadmasters, should go up to the Superintendents' Association, and thence to the Time Convention, as the supreme tribunal. Another suggested that all of these associations, and that of the car accountants, be amalgamated in one body, with special chapters, which should hold one annual meeting, like the American Association for the Advancement of Science. This latter plan could well be enlarged to include other organizations of technical and operating officers, such as the chemists, the superintendents of telegraph, etc., and it has the great merit of bringing together a large number of men who never meet each other in the ordinary course of business. It has, however, the disadvantages that several officers of any one road would be away from their duties at one time, and that any one subject should be considered by the different bodies consecutively, rather than simultaneously. Probably it would be found better, therefore, that the organizations should meet at different dates. Then a subject passed on by one association would go to the proper committee of the next higher association, and that committee would have time to prepare a report upon it. There seems to be no overwhelming reason why a conference committee of the various bodies should not arrange the dates of the year's meetings with some regard to the year's work.

It is not necessary that the associations of higher rank should leave the selection of subjects to the subordinate associations where the first action is taken. They could prepare and send down a list of matters on which action is desired.

There are two chief ends to be sought in any scheme for co-operation amongst the railroad associations. The traffic associations of course are not now under consideration. One object is to make action proceed logically to some definite end, so that any one subject will, in due course, and as rapidly as possible, be considered by all the organizations which have authority in the matter. When it is passed upon by the highest body it will then be settled for some time. The other object, which is to constantly raise the standard of discussion, flows naturally from the first. The members will feel that their action is serious and responsible, and a part of the whole scheme of railroad development, and they will put more work into their discussions than they are likely to so long as it is felt that these discussions are desultory and inconclusive.

But in establishing any plan of co-operation there are certain things to be particularly avoided. It is important not to destroy the independence and initiative of any one association; and it is quite as important not to introduce a cumbersome machinery that will delay action. On the whole, it is probable that the plan most likely to be successful is one that interferes least with the existing arrangements. The associations, as they now are, have come about as a result of the common interests and needs of their members, and so are likely to endure and prosper. We should expect the best results, not from any attempt at a close amalgamation, but from a loose federation, which should consist merely in an agreement that the associations should take rank in the same order as the customary rank of the officers who compose them, and in the co-ordination, through a conference committee, of topics for consideration and of dates of meeting. An experiment of this kind could be tried with little trouble, and we hope that it will be seriously considered in the autumn meetings of the associations.

Concerning Fast Trains.

A considerable amount of attention has been directed to the improved passenger service recently inaugurated between Chicago and Kansas City and other points, and statements have been freely made that the high speed of these trains has largely increased the coal consumption of the locomotives and the wear and tear of the rolling-stock and permanent way, and has not resulted in any decided increase of travel. These and other reasons are alleged to make the running of these fast trains unprofitable, and it is stated that the roads concerned will revert to the old time-table and content themselves with running the through trains at a moderate pace. The inhabitants of the cities which are served by these roads very naturally remonstrate against any retrograde step in the matter of speed.

This discussion naturally raises the question whether the advantages gained by fast trains are sufficient to offset the greater cost and risk. This manifestly chiefly depends upon two factors—the amount of the increased traffic attracted by the higher speed, and the increased cost of the faster service. The former

question largely depends upon local circumstances, as in some cases a decrease of a few hours in the time between two cities would be a great convenience, while in other cases it would simply mean an arrival in the small hours of the morning. A night train run at high speed over a road where sharp curves are frequent is not an unmixed benefit to passengers, as the inevitable oscillation causes many to spend a very uncomfortable night, while most persons enjoy the sensation of traveling at high speed in daylight. It cannot be doubted that, as a general principle, high speed stimulates travel, and that, in fact, is one of the reasons why the train has superseded the stage.

The expense of providing high speed evidently largely depends upon the appliances used. With a smooth road-bed, suitable engines and rolling stock, and few stoppages, an average running speed of 45 miles per hour can be easily attained unless the train is very heavy or the grades long and severe, or the curves numerous and of small radius. If, however, the stops are very frequent, the locomotive expenses are greatly increased, while weak and poorly fastened rails and an insufficiently ballasted road-bed will not only greatly increase the resistance to be overcome by the locomotive, but will largely augment the repairs both to rolling stock and permanent way and increase the chance of derailment. Insufficient signals, numerous stoppages and the possibility of meeting an open switch will also make the attainment of continuous high speed impossible and any of these three classes of unfavorable conditions will render impracticable a speed which could be safely and easily attained on a really well equipped railroad. It is, however, noticeable that defective track, the absence of proper signals and other conditions which make high speed impossible, also militate seriously against the safe and economical handling of traffic at a low speed, and hence it is not surprising that the public generally regard the regular running of fast trains as a sign of a well managed railroad.

The term high speed is used somewhat indiscriminately, and to most has a very indefinite meaning. If the difficulty of running a train regularly at a high speed is taken to increase approximately as the cube of the speed, a train run at 30 miles per hour requires fully 50 per cent. more care, skill, and attention to detail than one run at 25 miles per hour, while the task of running at 40 miles per hour involves fourfold the difficulties experienced in running at 25 miles. These proportions are merely speculative, but they have sufficient basis of fact to render important an increase of a few miles per hour in the speed of a train. The higher the speed the greater the difficulty of attaining an additional mile per hour.

The table which will be found on another page contains some interesting information as to speed of passenger trains between the chief cities of the United States. The table has been carefully compiled so as to represent as fairly as possible all sections of the country, and the rule of selecting as termini important cities indicates fairly the speeds at which passengers are conveyed between the pricipal centres of business. As it is practically impossible to make any fair allowance for the time lost in stopping at stations, or at level crossings, draw bridges, etc., the time given includes all stops. It is equally impossible to make any allowance for ferries and the time given is always, as far as possible, that from city to city, and includes the time lost by any ferries, etc., between the terminal points. The average distance between the stopping stations as marked in the time tables is given, and indicates the frequency with which stops are made for traffic purposes. On the great majority of roads many other stops are made for water, grade crossings, draw bridges, and other causes, both permanent and temporary. The Ramsbottom water trough and scoop renders it unnecessary to stop for water, and efficient interlocking signals can be used, which obviate all necessity of stopping at grade crossings. The fact that the famous Jarrett & Palmer special train was run for 439.5 miles without a stop over a road with such numerous curves and heavy grades as the main line of the Pennsylvania, shows what can be done in long runs without stopping, and should encourage railroad managers to minimize the time wasted in stopping at points where no money can be earned and where traffic is delayed rather than accommodated.

The table shows very clearly that the train service between New York and Philadelphia stands out pre-eminent both for speed and frequency of trains, while that between New York and Washington, Boston and Chicago respectively, is not far behind. The average speed of all trains between New York and these cities is over 30 miles per hour, which is a higher average rate than obtains elsewhere, and is exceeded only by a few of the fastest trains in the West and South.

The table shows that the fast trains between Chicago and Kansas City, which are said to have been such expensive luxuries, are, after all, run at a very moderate pace, and their speed of 30 to 31.5 miles per hour is exceeded by two Southern roads, one of which has the disadvantage of worse gradients, while neither serves such enterprising Western cities as Omaha, Minneapolis, St. Paul or Kansas City.

An unwillingness to run a through train at over 30 miles per hour, including a few stops, is a confession of weakness. Going south again, the table shows that a very cheaply constructed road, the Central of Georgia, actually attains a higher average speed between two comparatively small Southern cities than the great competing companies of the West attain between Chicago and Kansas City.

Even when the fastest trains between Chicago and Kansas City are compared with the fastest train between Savannah and Atlanta, the former come out only 3 miles per hour ahead. The stopping stations are nearly three times as frequent on the Southern road, and an allowance of only three minutes a stop makes the running speed equal.

The train between San Francisco and New Orleans is noticeable for the fact that it has the longest through car service of any line in the world, and in fact it would be impossible to find a continuous line of rail of this length on any other continent. The Canadian Pacific run through trains from Montreal to Vancover, 2,906 miles, but we believe sleepers are not run through for the whole distance.

The table shows that east of Chicago the speed of the fastest trains between the largest cities is about 40 miles per hour including stops, while the average speed of all through trains is about 32 miles per hour. West of Chicago and in the South the speed of the fastest trains is about 30 miles per hour, while the average speed of all through trains is about 27 miles per hour. In the Southwest the speed of the principal through trains is about 23 miles per hour. These figures in all cases include all stoppages.

Block Signals.

We print in another column a letter from a trainman concerning the practice of some American roads in block signaling. We publish this letter because it is not merely the opinion of a freight conductor, but is also a good representation of the views held by many intelligent superintendents. Notwithstanding the widespread use of, and faith in, the principles of block signaling, there is a strong sentiment in various quarters that there are good arguments on the other side. These arguments are not often formulated, but the feeling exists, nevertheless. This letter constitutes a strong expression of what may be called the Jersey Central sentiment; the conviction that, with wide-awake trainmen, fully alert to their duties, train running can be carried on better without block signals than with.

The primary object of block signaling is often lost sight of. It is not to be denied that in clear weather, by daylight, and with young and lively men, trains can be run on thousands of miles of railroad, for scores of years to come, with substantial safety and without block signals. But the very first reason for adopting block signals years ago, and the most important reason demanding their adoption now, is the fact that trains must be run when the weather is not clear, when the darkness is thick enough to be felt, through tunnels full of smoke and with men who will sometimes be negligent. Every one recognizes that under certain conditions, traffic will be more or less delayed by the use of the block system. Last year's collision at Hexthorpe, England, where 19 people were killed, is a melancholy illustration of the strong influence which this idea exercises over the minds of otherwise cautious railroad men. An immense traffic was imperiled and was actually involved in disaster because the delays necessary for safety were deemed unendurable. The theory of men like our correspondent doubtless is that the block system may be useful at night and during stormy weather, but that we should work without it when the weather and other conditions are favorable. But by a moment's reflection we see that any such partial or intermittent use of the system will bring in more dangers than it will cure. If we are to have the benefit of the principle at any time, we should employ it systematically at all times, and put up with the incidental inconveniences. Conditions of this kind have to be submitted to in other departments of business and are recognized as based on just principles. Book-keepers every day make hundreds of figures which would be unnecessary, and a waste of time, except for the necessity of following an inflexible system. "Langdon's" way of running trains recognizes this principle by making strict rules about going back with a flag when the brakeman is morally certain that no train is following.

The use of permissive blocking, which is the basis of the illogical system complained of by "Langdon," and which is quite prevalent in England as well as in this country, cannot be regarded otherwise than as an evil. It may be admissible as a lesser evil, but it shou'd be clearly understood that its faults are not chargeable against a scientific block system. It brings in just the train of doubtful conditions described in this letter, and neutralizes much of the good effect of an otherwise almost perfect system. The reason why "Langdon's" experience of 10 years and the opinions of the hundred men he has talked with are against the system is found in the existence of this loophole. Telling an engineman to run cautiously, and telling a flagman to go back with red signals when he knows that his going back will almost certainly be unnecessary, constitute one of the most troublesome combinations in railroad practice. The absolute block system in perfection entirely obviates "going back to flag." The old plan makes flagging of vital importance. Permissive blocking mixes the two, and while perhaps preventing some rear collisions, certainly leaves the door open for one large class, those which occur from careless handling of trains when it is known that other trains are near. The essence of permissive blocking is to run with caution; but most rear collisions occur when the runner is using some caution, not when he is "humming along" at full speed. Railroad men who argue against the block system are prone to pass lightly over the objections brought against *their* system as regards its suitability for a heavy traffic where tunnels are numerous, fogs frequent and night trains heavy. But passengers now-a-days want to ride as promptly, as fast and as safely when the engineer cannot see the chimney of his own engine, as when he can see three miles ahead.

The statement that officers demand fast running by engineers when it is not safe to run fast, is undoubtedly practically true in many cases. As in the case of men sent out with money to influence a legislature, the injunction is to do nothing wrong, but the person enjoined unmistakably understands that he must achieve success. The mistake of an operator which has recently come under "Langdon's" observation shows the value of electric locking for block signals.

The Railway and Canal Traffic Act.

The English Railway and Canal Traffic bill will probably become law in substantially the shape in which it left the House of Commons at the end of last month. Its history has been somewhat like that of our own Inter-state Commerce law, except that the position of the two houses was reversed; the lower house taking a more moderate position, while the Lords, as representing the land-owning element, on the whole desired more stringent measures.

A bill for railroad regulation was introduced by Mr. Mundella in 1886, and seemed likely to become a law; but political complications caused a dissolution of Parliament, and the whole matter had to be taken up over again. In the meantime, the commercial depression in England, and the apparent success of our Inter-state Commerce act, had given additional force to the demand for railroad regulation. The bill as introduced into the present Parliament was, on the whole, somewhat stricter than its predecessor; and the tendency of the various amendments adopted has been to make it still more unfavorable to the railroads.

The present Railway Commission is much modified under the new act. Two of its members are likely to be retained, but the chairman loses his office. Under the present act the Commission will have a different chairman, according as it deals with English, Scotch or Irish cases, the presiding officer for each section being a judge nominated by the highest judicial authority of that country. The new Commission will have wider powers than the old. It can award damages as well as make rulings. It can entertain complaints on a greater variety of subjects, and from a greater variety of complainants. The power of appeal is also somewhat limited.

The Commission is intended to be a more purely judicial body than our own. The administrative work is largely given over to the Board of Trade. This body is to deal not merely with railroad returns, but also with many matters of classification and rates; and under many circumstances may be required to fix "just and reasonable" rates for the companies to charge.

With the short-haul clause of the bill, Parliament has had as much trouble as Congress; and the result

is by no means successful. The words "the shorter being included within the longer distance" are not found in the English act; and this omission will greatly increase the difficulty of applying it. Nor is the general phraseology any clearer than our own, some persons claiming that it can be construed as requiring equal mileage rates. On one point it is more explicit. An amendment introduced in the Lords and accepted by the Commons prohibits preferential rates on foreign merchandise. Another clause, which may give rise to much litigation, is one by which any harbor that thinks itself placed at a disadvantage under the existing schedule of rates may demand that it shall be placed on an equality with its rivals.

We have grave doubts as to the success of the law. We do not believe that proper arrangements have been made for its interpretation. A measure whose terms are so vague needs to be applied with consistency as well as with care. But the administrative provisions of the act seem to make this impossible. It provides for quasi-judicial action on the part of two independent bodies—the Board of Trade and the Railway Commissioners. The former body must, under certain circumstances, take positive action in fixing rates. On what principle are they to proceed? The original bill said that they should prepare a schedule of rates and charges which would, in their opinion, be "upon the whole equivalent" to existing maxima. In other words, they were to take the present scale and revise its details in such fashion as to bring it more into harmony with the necessities of business as at present organized. But it soon appeared that this by no means suited the views of Parliament; nor, in fact, could Parliament agreed upon anything as expressing its collective wisdom on the subject. Although the Board of Trade asked for guidance, Parliament would not give it; and the Board is now simply directed to make the schedules "just and reasonable." But this is not administrative work. It is judicial work of the most delicate character. The Board must decide upon certain general principles of action. If the Commission accepts these principles without change, they deprive themselves of their most important function—in fact, of the only one which strongly distinguishes them from an ordinary court. But if they attempt to apply any different principles from those of the Board of Trade, the whole matter will be thrown into endless confusion.

This comparison is heightened by the constitution of the Commission itself, with three different presiding judges. This was done in order to bring the decisions into closer harmony with the judiciary of the three kingdoms; but there is great danger that they may sacrifice the more fundamental matter of having them thoroughly in harmony with each other. The more vague the provisions of the act, the greater the necessity of such consistency. It almost seems as though the English act had been drawn in such a fashion as to render this result impossible. We note that the railroad interest in Parliament have made but feeble opposition to this bill in its latest shape. Can it be because they foresee that it will prove a dead letter? The law lays down little that is definite and makes no provision by which such definite action can be secured elsewhere.

It is too early to make many predictions as to its effects on trade. The prohibition of low import rates by English railroads will probably give a stimulus to the direct shipping trade from foreign countries to the point of destination, instead of by combined rail and water routes. In any event, the aggregate effect of such legislation in England is much less than it is in this country. In the first place, the English railroads have a much larger amount of profitable business which is not much affected by any legisiation of this kind. In the second place—and this is much more important—so few new lines are built in England that the business community does not feel the effect of any check to railroad enterprise. For these reasons we do not apprehend any disastrous results from the new law; but we shall be surprised if it proves to have beneficial ones.

The maximum size of locomotive boilers has recently been materially increased. The diameter of the barrel for many years rarely exceeded 4 ft., and the increase inch by inch to 50 and 52 in. was slow. Recently, however, boilers of 60 in. diameter have been frequently built, and several boilers of 64 in. diameter are now running. Such a large barrel can easily contain flues with 2,000 sq. ft. of heating surface, an amount which should be sufficient even with inferior coal. Mr. E. D. Leavitt, the well-known mechanical engineer, has used even larger boilers of the locomotive type for raising steam to supply pumping and hoisting engines. It might be thought that the enlargement of the locomotive type of boiler would present difficulties, as the large size of the plates would give an excessive amount of expansion and contraction. Experience has shown, however, that the locomotive type boiler, with 90 in. diameter of barrel and proportionately large fire-box stands very well, as many boilers of this size, made from Mr. Leavitt's designs, have been running for many years. The latest Italian iron-clad, the "Lepanto," an immense vessel of 14,850 tons displacement, is fitted with 16 large locomotive type boilers, forced draft being used. Each boiler has 376 brass 2-in. tubes, 7 ft. 7 in. long, giving a total heating surface of 1,670 sq. ft., while the grate surface is 42.2 sq. ft. The cubic capacity of the fire-box is 260 cub. ft., and the steam space is 210 cub. ft., while each boiler contains 14,805 lbs. of water. The diameter of the barrel is 79 in. and the complete boiler measures 14 ft. 5 in. long by 8 ft. wide by 9 ft. 6 in high. Hitherto attempts to use locomotive type boilers in groups aboard ship have ended disastrously, owing to the difficulty of properly distributing the feed, but the trials of the "Lepanto" did not develop any such defect. Possibly this was owing to the low boiler pressure, only 60 lbs. per sq. in. The speed realized was 18.38 knots on an eight hours trial with 16,150 I. H. P. The engines work non-compound when developing this maximum power, and the coal consumption was at the enormous rate of 564 gross tons per 24 hours, an amount greatly in excess of that of the largest Atlantic liners. While the power, speed and displacement are not very dissimilar, the finer lines, higher boiler pressure and compound engines materially reduce the coal consumption of the "Umbria" and "City of New York" below the 3.26 lbs. per I. H. P. per hour of the "Lepanto." The total ratio of expansion was 2.63, and therefore it would appear that a condensing engine with 60 lbs. pressure is somewhat less economical than a locomotive with 150 lbs. pressure, both being supplied with steam from the same type of boiler, both engines working at high piston speed, and at about the same ratio of expansion.

July Accidents.

Our record of train accidents in July, given in this number, includes 61 collisions, 86 derailments and 10 other accidents; a total of 157 accidents, in which 60 persons were killed and 169 injured.

These accidents are classified as follows:

COLLISIONS:		
Rear	29	
Butting	27	
Crossing and other	5	
		— 61
DERAILMENTS:		
Broken rail	3	
Loose or spread rail	2	
Broken bridge	3	
Broken frog	1	
Broken wheel	1	
Broken axle	7	
Broken truck	3	
Fallen brake beam	1	
Broken parallel-rod	1	
Broken draw-bar	1	
Broken coupling	1	
Loose cow-catcher	1	
Misplaced switch	4	
Rail removed for repairs	1	
Runaway train	1	
Overloaded car	1	
Cattle on track	5	
Washout	3	
Landslide	3	
Accidental obstruction	4	
Malicious obstruction	1	
Purposely misplaced switch	5	
Unexplained	33	
		— 86
OTHER ACCIDENTS:		
Cars burned while running	2	
Boiler explosion	3	
Broken parallel-rod	2	
Broken axle	1	
Broken truck	1	
Miscellaneous	1	
		— 10
Total number of accidents		157

The causes of collisions where given were as follows:

	Rear.	Butting.	Crossing and other.	Total.
Trains breaking in two	12	..	..	12
Misplaced switch	2	1	..	3
Failure to give or observe signal	2	..	..	2
Mistake in giving or understanding orders	1	7	..	8
Miscellaneous	2	2	..	4
Unexplained	10	17	5	32
Total	29	27	5	61

A general classification shows:

	Collisions.	Derailments.	Other.	Total.	P. c.
Defects of road	..	9	..	9	6
Defects of equipment	13	16	7	36	23
Negligence in operating	16	7	..	23	15
Unforeseen obstructions	..	21	..	21	13
Miscellaneous	..	..	3	3	2
Unexplained	32	33	..	65	41
Total	61	86	10	157	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other.	Total.	P.c
Passenger	28	29	6	63	30
Freight and other	87	57	4	148	70
Total	115	86	10	211	100

The casualties may be divided as follows:

	Collisions.	Derailments.	Other.	Total.	P. c.
KILLED:					
Employés	16	28	4	48	80
Passengers	..	6	..	6	10
Others	6	..	..	6	10
Total	22	34	4	60	100
INJURED:					
Employés	43	48	1	92	54
Passengers	21	48	2	71	42
Others	1	5	..	6	4
Total	65	101	3	169	100

Twenty-seven accidents caused the death of one or more persons, and 56 caused injury but not death, leaving 74 (48 per cent. of the whole) which caused no personal injury worthy of record.

The comparison with July, 1887, shows:

	1888.	1887.
Rear collisions	29	26
Butting	27	33
Crossing and others	5	2
Derailments	86	53
Other accidents	10	3
Total accidents	157	117
Employés killed	48	49
Others killed	12	17
Employés injured	92	104
Others injured	77	167
Pass. trains involved	63	54
Average per day:		
Accidents	5.06	3 77
Killed	1.93	2.13
Injured	5.45	8.74
Average per accident:		
Killed	0.382	0.569
Injured	1.077	2.317

The worst accident of the month was that on the Virginia Midland, July 12; another nearly as bad occurred on the Norfolk & Western on the 22d, but it was a freight train. These have already been discussed in our columns. Aside from the Virginia derailment, we have reports of but one passenger killed. This case was in a derailment occasioned by a cow on the track. The number of derailments from this cause seems to show no diminution, and now, as heretofore, railroads seem to be built and operated long before their owners think they can afford to have them properly fenced. A characteristic habit of cattle in swampy districts is to get upon high ground when they wish to rest, and we therefore hear frequently, especially in warm weather, of animals lying down on the track. When they do this at night they, of course, constitute a most dangerous kind of obstruction, very hard to guard against.

A startling instance of the chances taken in freight-train transportation is exhibited in the derailment of the 26th, where six tramps were smothered to death at one stroke by the upsetting of a car of corn. The reader will observe two casualties to Chicago, Burlington & Quincy men in Chicago, which are not attributable to a train accident and therefore are not included in our totals.

Of the unexplained derailments, three are described as "at a switch." It is of course generally assumed in such cases that the switch was defective and was the cause of the derailment. But such is not always the fact, and we do not classify these accidents under "defects of road" unless the evidence seems clear. Roadmasters who desire to uphold the work and reputation of their own department—as all railroad officers of course do—will see that cases of this kind afford good opportunity for the study of fine points in their line of work with a view to successfully defending themselves.

A derailment in Missouri of an engine running backwards is ascribed to the fact that the tender was nearly empty of both coal and water. As tender trucks frequently curve very badly, the curve plates being rusted from water dripping from the tank, it is reasonable to suppose that this assumption is correct, but of course all master mechanics will agree that inspectors should keep tenders in such condition that they will curve with facility at all times, whether empty or loaded. The breakage of an axle under a tender in Alabama ditched a mail car and came near derailing the train, and yet was not discovered by the engineer until the men in the cars had stopped the train; another illustration of the peculiar dangers connected with the tender in a passenger train, which is often the only vehicle on which no person is riding. A peculiar derailment of the month is that caused by an aggressive ferryboat. That bridge had probably not yet been furnished with the latest New Jersey signals.

Of the purposely misplaced switches, one was the work of strikers in Chicago; the others, like most similar cases in all our lists, are recorded on the evidence of published reports. It is, of course, natural, in the absence of positive evidence as to the misplacing of a switch, to attribute it to unknown evil disposed persons.

The need of better discipline of conductors and engineers is especially shown in a number of the accidents this month The collision on the 16th, where both conductor and engineer failed to examine the register book at a station, is an evidence of a state of things of which there are indications on many roads, to wit, that the conductors depend upon enginemen, and enginemen upon conductors, for the performance of important duties, the neglect of which is often fatal and the performance of which is especially enjoined upon both men with equal force. The circumstances reported in connection with those trains which were wrecked as a result of breaking in two are specially noticeable, much that is reported concerning them going to show that alert and experienced engineers, conductors and brakemen, working in harmony, would have prevented these disasters, which must have aggregated many thousands of dollars. A peculiar derailment was that of an engine which got beyond control in descending a grade by the bursting of the cylinders. The lack of any explanation of why there was not a hand brake, or why it was not used, seems to indicate gross carelessness. Of the collisions reported, three were rapidly-moving trains striking cars standing on the main track more or less remote from stations. Cases of this kind demand careful notice, because the ordinary block system is generally no protection against them. In cases where a car is run out upon the main train immediately before the arrival of a train, even electric track-circuit block signals would be no protection. One engineer who proceeded past a meeting point as though there were no station there, explains his action by saying that he "forgot about side-tracking." This is only a marked example of what occurs in quite a number of butting collisions in the course of every year. There is carelessness on the part of the engineer as to where the train should be

side-tracked, and the conductor, whose duty it is to check the runner in blunders of this kind, grasps the situation and proceeds to perform his duty, but does it several seconds or minutes too late. It is evident that the conductor, 1,000 or 1,500 ft. back of the engineman, can have no control over the latter's actions, except by the most alert attention To proceed to stop a train a mile beyond the point where slackening should begin makes all the difference between safety and disaster, and is a complete neglect of duty as contrasted with the careful compliance with the rule which a conductor is supposed to render.

We have had occasion to note from time to time the agitation carried on in Chicago to compel the railroads to protect their highway crossings. The papers of that city publish occasionally figures showing the loss of life at those crossings, and certainly there is sufficient reason for urging prompt and effectual action. There is, however, something to be said on the side of the railroads. To maintain gates and pay a gate tender at one crossing will take a sum equal to the interest on $10,000, at least, and few of the Chicago roads are likely, under existing conditions, to hunt around for ways of spending money. Many of the less used crossings could be made comparatively safe by the use of bells worked from a track instrument, and because of the economy of the arrangement it would often be adopted where gates would not be put in. But instead of facilitating this measure of protection, the city introduces an obstacle by forbidding putting up new wires. It is not long since that a city official was applied to for a permit to string a wire for a signal at one of the Chicago street crossings. There were numerous other wires along the line, and an additional one could make no difference. The official pointed out the ordinance and made the proper objections, but at last said that if a pass over the X. & Y. were brought to him the permit would be given. The pass was not given, the permit was not granted, and the signal was not put in. It now remains to fight for gates at that crossing. Several morals may be drawn from this little tale.

Two accidents of a similar nature, both occurring at railroad crossings, and said to have been caused by the failure of the air-brakes, are reported from Chicago. The first was at South Lawn, on Thursday morning, Aug. 16, at a point where the Illinois Central and the Grand Trunk roads cross. The Cincinnati express on the former was approaching, down grade, from the south, and the Grand Trunk freight train was east-bound. The runner, James Devine, of the passenger engine, explained that he put on the air as his train approached the crossing, but found that the brakes did not work, and though he whistled for the hand brakes the collision occurred. He thinks that something under the locomotive had got out of place and thrown up a stone from the ballast, which turned the air cock between the locomotive and the tender. Although the wreck was a bad one but nine persons were injured, one of them it was thought fatally.

The second accident occurred on the evening of the same day, at 10:30 o'clock, at the crossing of the Chicago, Burlington & Quincy, and the Pittsburgh, Cincinnati & St. Louis roads. The St. Paul express on the Burlington was approaching the crossing at about 15 miles an hour, while a Milwaukee & St. Paul freight train was passing over the crossing along the "Pan-Handle" tracks, which are used as transfer tracks for stock-yard traffic. The engineer of the Burlington train claims that he applied the air brakes, and that they would not work, and in this case also the collision occurred before the hand-brakes could take effect. The engineer makes the positive statement that the air-brakes had been tampered with. Fortunately nobody was seriously hurt.

Without other evidence than what we have, we should suspect that in neither of these cases has the true cause of the accident been given, and especially in that of the Illinois Central-Grand Trunk collision. The story of the runner is peculiar, and he had a great temptation to cover up a lack of vigilance on his own part. The other case is at once put down against the striking engineers of the Burlington, who are suspected of having tampered with the air-brake cocks. Improbable as this suggestion is, it is another instance which calls attention to the folly of the brotherhood in pretending to keep up the strike. They lose in public estimation by every outrageous act which is charged against them, whether they are guilty of it or not.

Within the last week a severe storm of rain and wind has traversed a wide belt of the country, from the Gulf up across Tennessee and West Virginia to the Middle Atlantic Coast and New England.

In Louisiana great damage to the sugar and rice crops is reported. Many coal boats were sunk at New Orleans, and both the Louisville & Nashville and the Illinois Central have been interrupted by washouts. At Morgan City boats, barges and one floating elevator are reported wrecked.

In the Upper Ohio Valley the storm was again very destructive. The railroads centering in Wheeling have suffered, and it is said that the Baltimore & Ohio has lost every bridge between Pittsburgh and Wheeling. Press dispatches state that the entire city is without natural gas, owing to the bursting of the pipes, and 15,000 people are without a supply of water owing to the fall of the stone bridge across Wheeling Creek, at Main street. The electric light has given out, and street-car travel is interrupted as the electric light plant is disabled. The Baltimore & Ohio has been completely cut off from Pittsburgh, and the Pennsylvania, the Pittsburgh, Virginia & Charleston and the Pan Handle have all suffered from washouts.

The storm was very severe along the Middle Atlantic coast, and considerable loss of life and property is reported. A land slide on the West Shore near Newburg caused a derailment but no loss of life. Few railroad accidents have yet been reported as resulting from the storm.

A few years ago few Europeans, however complete their disguise, ventured to brave the fanaticism of the inhabitants of the mysterious towns of Merv and Bokhara; but with the opening of the Central Asian Railroad we read that an excursion train will leave Paris on Sept. 11 for Central Asia. The International Sleeping Car Co. will, by arrangement with General Annenkoff, the constructor of the Trans-Caspian Railway, start a train made up of dining, drawing-room and sleeping cars, etc., for Vienna, where there will be a stoppage of 24 hours. The next halt will be made at Kieff, where two days will be allowed, and the same at Odessa. From Odessa the excursionists will be conveyed by water to the Crimea, and, after a stay of five days in that peninsula, they will embark for Novrossick, going on by rail to Vladikavkas, in the north of the Caucasus, and thence to Tiflis. After a stay of two days at Tiflis, they will visit Baku and its oil wells, crossing the Caspian to the new railway to Samarkand, where they arrive on Sept. 30. They will visit Merv and Bokhara, returning to the south of the Black Sea, proceeding from Baku to Batoum, by way of Tiflis, and thence to Constantinople, putting in at Trebizond, Sansuun, etc. The return journey will be completed by the new lines through Bulgaria and Servia, with 24 hours at Sofia, Belgrade and Pesth. The excursionists will reach Paris on Oct. 30.

The Iowa Commission has rendered a decision which, if the telegraphic summary be correct, would subject railroads to great inconvenience. The Chicago, Milwaukee & St. Paul had refused to haul two Burton stock cars for a shipper who did not comply with certain rules and regulations of the company regarding that class of cars. The Commissioners have decided that the company violated the law. They say that when a shipper has tendered his cars to a station agent he has done all that the law requires of him; that it is the duty of the agent to forward the cars whenever offered; and that if any rules of the company are in conflict with the law they must be amended.

Not knowing precisely what were the rules in question, we cannot pass judgment on the merits of this case; but the general principle uttered by the Commission is bad, almost as bad for the public as for the railroads. Of all the things needful for safe and efficient operation, nothing is more important than the right to secure uniformity in methods of handling cars. A failure to secure a certain uniformity produces not merely a loss to the railroad, but a great deal of vexation to the shippers and some unnecessary risks in handling. This bad economy and this vexation have made the system of private ownership of cars an undesirable one. It was originally supposed, when the first railroads were built, that large numbers of cars would be owned in this way. But the plan was abandoned for the reasons just given. England is the only country where private ownership of freight cars is at all general, and the experience of England in this respect has not been favorable.

To prevent the abuses of this system the railroads must have the power to protect themselves by reasonable rules and regulations. The general denial by the Iowa Commission of any such authority seems like an effort to force the railroads to return to a bad system and make them shoulder all the burden and inconvenience of so doing. It is hardly necessary to say that such an attempt must in the long run be injurious to the public.

A little more than a year ago the Legislature of Illinois passed an act "in regard to the dangers incident to railroad crossings on the same level." It was provided in this act that engines can pass grade crossings without stopping in case the crossings are protected by interlocking signals which have been examined and approved by the Board of Railroad and Warehouse Commissioners. It was also provided that the Commissioners may appoint a competent engineer to examine and report on such apparatus. In accordance with the law an examination will be made of the interlocking fixtures which have been put in at Hegewisch, the crossing of the Pennsylvania and the Michigan Central; at Bloom, the crossing of the Michigan Central and the Chicago & Eastern Illinois; at the Union Stock Yards, where several railroads cross, and at Peru, the crossing of the Rock Island and the Burlington. The Union Switch & Signal Co. and the Elkhart Interlocking Signal Co., of Elkhart, Ind., have filed with the Board models of their interlocking apparatus.

An Inter-state Deep Water Convention is to be held at Denver, Col., Aug. 28. The states and territories west of the Mississipi are to be represented by delegates appointed by governors, city or town officers, or commercial boards. Of course the object of this convention is to further the establishment of a deep water harbor on the Gulf. Reduced rates on some of the railroads have been secured, and considering the way in which the convention has been called the attendance should be large and representative. It is to be assumed that the convention will attempt to promote action by the general government. What we should like to see tried, however, would be the construction of a harbor by private enterprise, and that we understand is likely soon to be undertaken.

The British Board of Trade returns show an increase of £12,650,304, or 6 per cent., in the value of imports, and £9,962,833, or 8 per cent., in the value of exports, for the first seven months of 1888. There has been a fall of 2.2 per cent. in the quantity of iron and steel exported, but an increase of 8.2 per cent. in its value. The pig iron exported to this country has fallen from 249,972 to 90,222 tons; unwrought steel, 150,169 to 42,219 tons; steel rails from 90,955 to 38,162 tons, and old iron from 133,125 to 13,556 tons. Bar, angle and rod iron exported to the United States has increased from 1,651 to 3,091 tons; hoops, sheets, etc., from 17,330 to 21,723 tons; tin plates from 156,738 to 167,882 tons, and in value from £2,073,275 to £2,412,052, and the value of hardware and cutlery sent here has increased from from £207,291 to £211,143. For the month of July the export of steel rails to this country has fallen from 26,823 to 2,526 tons. The total shipments of steel rails for the seven months of the two years were 413,310 and 412,136, showing, on the whole, that railroad building in the world is about as brisk as last year.

The race between England and Scotland still continues, and the speeds attained in many cases exceed those mentioned in our last issue. The highest speed attained has been a run by the West Coast route, where the distance between London and Edingburgh, 400 miles, was traversed in 7 hours 7 minutes time, of the train in motion. This gives a speed of 56.2 miles per hour. The best part of the run was 90 miles in 90 minutes, and as this run was made over a summit of over 900 ft., with a grade of 70 ft. to the mile, the performance is possibly the best ever made. The East Coast route has the advantage of better gradients and lower summits, but a heavier train was hauled. Some of the individual runs are given below. The weight of the West Coast train varied from 296,000 to 348,000 lbs. and the East Coast train averaged about 417,000 lbs. for engine, tender and train. The West Coast train would seat 150 passengers and the East Coast about 250 passengers. It is stated that both trains were well filled.

East Coast.	Miles.	Time.	Speed.
London to Grantham	105	1:57	53.8
Grantham to York	83	1:31	55.4
York to Newcastle	84	1:28	57.:5
West Coast.			
Preston to Carlisle	90	1:30	60.0
Crewe to Preston	51	50	61.2
Carlisle to Edinburgh	101	1:44	58.3

These runs were made without stoppage, though the speed of the trains was somewhat slackened through crowded junctions.

The largest passenger terminus in London, Liverpool street is to be enlarged at a cost for land alone of $3,250,000. The extension will enable the number of trains to be increased from the present figure, 700, to about 1,000 daily. The suburban trains will be run faster, and it is believed that the increase in suburban passenger traffic will fully pay the interest on the capital outlay. The increased passenger receipts during the last 10 years was $2,500,000, a large portion of which was due to workmen taking advantage of cheap tickets sold in packets at a reduced rate, and living in the suburbs and traveling to and fro every day to work in the city.

The channel tunnel, if completed, between England and France would doubtless carry a heavy passenger travel, especially in summer. During August 1,600 persons a day, or 12,000 a week, crossed the English Channel by the various routes. Reckoning 80 passengers per train this traffic would require 10 trains each way per day, presuming that all the passengers now crossing would use the quicker route under ground.

A long trestle has been built by the Portland & Vancouver Railroad to get across the bottom land of the Columbia and reach deep water. The trestle is 8,000 ft. long, with two truss spans across arms of the stream, and extends 700 ft. into the stream. The river is crossed by ferry from the end of the trestle, in about 10 minutes.

Train Accidents in July.

COLLISIONS.

REAR

1st, on Pittsburgh, Fort Wayne & Chicago, at Berlin Centre, O., to avoid collision between an east-bound passenger train standing at the station and a west-bound passenger train approaching at uncontrollable speed, the latter was turned on to a side track and ran into some freight cars, 3 of which, with the engine, were badly damaged. Two trainmen injured by jumping. It is said that the air brakes did not work properly.

4th, on Louisville & Nashville, near Warrior, Ala., freight train ran into the rear of a construction train, wrecking engine and several cars.

6th, on Louisville & Nashville, near Flint, Ala., a freight train descending a grade separated into three parts, which afterwards collided, damaging half a dozen cars and injuring a tramp.

9th, on New York Central & Hudson River, in East Rochester, N. Y., a passenger train ran into the head of a switching freight train moving backward, damaging both engines.

9th, on Baltimore & Ohio, at Scipio Siding, O., a freight train broke in two and the rear section ran into the forward one, wrecking 6 cars.

10th, on Missouri Pacific, at Gascondale, Mo., an empty engine ran into the rear of a freight train; engine and caboose badly damaged.

12th, on Alabama Southern, at Collbran, Ala., freight train broke in two and the rear section ran into the forward one, wrecking half a dozen cars.

12th, on Long Island, at Fresh Pond, N. Y., a switching engine ran over a misplaced switch and into a freight train, doing some damage.

13th, on Pittsburgh & Lake Erie, at Youngstown, O., passenger train ran into the rear of a freight, wrecking an engine and several cars.

13th, on Northern Pacific, near Bluffton, Minn., freight broke in two and the rear section ran into the forward one, damaging several cars.

14th, on Delaware & Hudson Canal Co.'s road, near Bainbridge, N. Y., a freight train broke in two in starting from

a water tank, and the rear section ran back down grade into the head of a following freight train, wrecking an engine, caboose and several cars.

14th, on Nashville, Chattanooga & St. Louis, near White Bluff, Tenn., several cars of a freight train became detached while ascending a grade, and ran back into some cars at the foot of the grade, doing considerable damage.

14th, on Central Pacific, at Vallejo Junction, Cal., a freight train collided with a construction train, wrecking an engine and several cars; 2 laborers injured.

14th, on Delaware, Lackawanna & Western, at Homer, N. Y., passenger train ran over a misplaced switch and into a loaded coal car, doing considerable damage.

14th, on Pennsylvania, at Ashland, Pa., a freight train in descending a grade broke in two and the rear section ran into the forward one, piling 19 cars up in a bad wreck.

14th, on Wabash Western, near Bridgeton, Mo., a freight train ascending a grade broke in two, and the rear section ran back down grade and collided with a following passenger train, wrecking the engine and several cars; engineer killed, fireman injured.

15th, early, on Burlington & Missouri River, near Berks, Neb., a passenger train which had stopped at a flag station, was run into by a closely following passenger train, wrecking an engine and a sleeping car; 1 trainman fatally and 4 passengers slightly injured.

17th, on Delaware, Lackawanna & Western, near Waverly, N. Y., freight train ran into a preceding freight which had stopped on a curve, wrecking engine, caboose and 5 cars. The runner of the forward train was under his engine at the time, and was badly hurt.

18th, very early, on Duluth & Iron Range, at Wissakode, Minn., owing to misunderstanding of orders; a freight train ran into a preceding freight, damaging engine, caboose and several cars, injuring an engineer and two passengers in the caboose.

18th, on Louisville & Nashville, at Franklin, Tenn., a yard engine ran into an officers' car, doing some damage.

19th, early, on Louisville & Nashville, at Brocks, Ala., freight train ran into some flat cars standing on a siding, doing some damage.

20th, on Fitchburg, near Petersburgh Junction, N. Y., freight train broke in two and the rear section ran back down grade and collided with an empty engine, which, with 2 cars, was damaged.

20th, on East Tennesse, Virginia & Georgia, near Cleveland, Tenn., passenger train ran into a box car standing on the main track; engineer and fireman injured.

25th, on Pennsylvania road, near Kinzer, Pa., a freight train ran into a preceding freight, wrecking engine, caboose and 4 cars; 1 trainman injured.

25th, on Chesapeke & Ohio, near Charleston, W. Va., engine of a freight train broke away from the cars and afterwards was run into by them, damaging the tender and 1 car.

26th, on Union Pacific, near Yutan, Neb., freight train broke in two and the rear section ran into the forward one, wrecking sever cars. A box car containing shelled corn was thrown over an embankment and stood on end, and 6 tramps who were in it were smothered to death.

27th, on Chicago & Atlantic, at Marion, O., freight train collided with some box cars standing on the main track, wrecking engine and several cars.

30th, 3 A.M., on Hannibal & St. Joseph, near Round Grove, Mo., fast passenger train ran into a freight car, doing considerable damage. The freight car had been standing on a side track, blocked with a stick of wood, the brakes being out of order. A freight train pushing on to the side track pushed this car over the block and it ran uncontrolled a mile out on the main track to the point where it was struck. Engineer and fireman slightly injured.

31st, on Louisville & Nashville, near East Nashville, Tenn., the first of three freight trains bound in the same direction broke in two and a triple collision resulted, in which several locomotives and cabooses were damaged.

BUTTING.

2d, on Grand Trunk, at Percy, N. H., butting collision between a passenger train and a freight train entering a side track, damaging both engines and injuring a passenger who was passing from one car to another.

6th, on Pennsylvania, near Nanticoke, Pa., butting collision between two passenger trains running at high speed, owing to a dispatcher's mistake, wrecking both engines and several cars of each train; 2 trainmen and 9 passengers injured.

6th, on Philadelphia, Wilmington & Baltimore, near Seaford, Del., butting collision between a passenger train and a freight, doing considerable damage.

11th, on Northern Pacific, at Prickley Pear Junction, Mont., butting collision between two freight trains, wrecking both engines and several cars.

12th, on Louisville & Nashville, near English, Ky., the runner of a locomotive which had been sent out to assist a passenger train, the engine of which had broken down, mistaking the exact location of the disabled train, ran into it, wrecking both engines.

15th, on Western North Carolina, near Asheville, N. C., a butting collision between two freight trains wrecked both engines and several cars, injuring 5 trainmen. The accident was caused by an operator failing to deliver orders.

16th, on Louisville & Nashville, near Jemison Station, Ala., the forward portion of a freight train which had broken in two in descending a grade, in returning for the detached portion, backed into it while moving at considerable speed, wrecking 8 cars and injuring a brakeman.

16th, on Texas & Pacific, near Longview Junction, Tex., butting collasion between two freight trains, wrecking both engines and several cars. It is said that the crew of one of the trains left the preceding station without examining the register and forgetting that a train was due.

16th, on Cincinnati Southern, in Ludlow, Ky., butting collision between a north-bound passenger train and a switching freight train, damaging both engines and several cars.

17th, early, on Louisville & Nashville, near Oxmoor, Ala., butting collision between a north-bound passenger train and a freight train, both engines and several cars of each train being piled up in a bad wreck; 2 trainmen killed, 4 trainmen and 4 passengers injured. It is said that the freight crew disregarded orders, and that the engineer's watch was 25 minutes slow.

17th, on Central Pacific, near Sobrante, Cal., butting collision between a freight train and a construction train; 1 trainman killed and several injured.

18th, on Cleveland & Pittsburgh, near Pittsburgh, Pa., butting collision between two freight trains, wrecking 3 engines and several cars.

18th, on Burlington & Missouri River, at Curtis, Neb., butting collision between two freight trains damaged both engines and injured 1 trainman.

18th, on New York, Lake Erie & Western, near Middletown, N. Y., butting collision between a westbound freight train and a freight just moving out of a side-track, disabling the engines.

19th, on St. Louis, Iron Mountain & Southern, near Knobel, Ark., butting collision between a passenger train and a freight, doing considerable damage; 1 passenger injured.

19th, on Louisville & Nashville, near Barbourville, Ky., butting collision between a passenger train and a construction train, killing the engineer and a brakeman of the latter and injuring 2 laborers.

20th, on Baltimore & Ohio, at Newark, O., butting collision between two passenger trains, disabling both engines.

20th, very early, on Central of New Jersey, near White Haven, Pa., butting collision between two freight trains in a tunnel, badly wrecking both engines and several cars; 1 trainman killed, 5 injured. It is said that one of the runners forgot his orders.

22d, very early, on Norfolk & Western, near Forest, Va., butting collision between a freight train and a construction train, wrecking both engines and 9 cars; 3 trainmen and 5 laborers killed, 1 trainman and 2 laborers injured. The conductor and engineman had leave to run against "third 57"; they collided with second 57, which they erroneously assumed they had already met.

22d, on Boston & Maine, near Northampton, Mass., an east-bound freight train collided with a construction train moving backward, doing some damage. The engine of the construction train having been abandoned just before the crash, with her lever reversed, broke away from the tender and, after running at high speed for some distance, went into the ditch.

23d, on West Shore, at Alabama, N. Y., as a fast passenger train approached a side-track containing a freight train, a confused brakeman suddenly set the switch for the siding, causing a collision, both engines and several cars of each train being badly wrecked; 2 trainmen injured.

23d, on Louisville & Nashville, near Adger's, Ala., butting collision between a freight train and a construction train, damaging both engines.

24th, on Richmond & Petersburg, at Petersburg, Va., butting collision between a freight train and an empty engine at the bridge over the Appomattox River, throwing the engine over an embankment and 2 freight cars into the river.

29th, on Newport News & Mississippi Valley, near Mead's, Ky., butting collision between two freight trains, damaging both engines and derailing 3 cars; 3 trainmen injured.

31st, on Central Pacific, at Antelope, Cal., butting collision between two freight trains disabled 3 engines and wrecked 10 cars.

31st, on Wabash Western, at Belleville, Mich., butting collision between a passenger train and a freight train wrecked both engines. The runner of the freight forgot his orders to side-track.

31st, on New York, Chicago & St. Louis, at Cleveland, O., butting collision between a passenger train and a yard engine, damaging both locomotives and a baggage car.

CROSSING AND OTHER.

7th, at Fostoria, O., a Baltimore & Ohio passenger train ran into a Toledo & Ohio Central passenger train at the crossing, both locomotives being overturned and badly damaged.

11th, at the crossing at Longmont, Col., a Denver, Utah & Pacific freight train ran into a Union Pacific passenger train, wrecking engine and derailing several cars.

25th, night, on Rome, Watertown & Ogdensburg, at Philadelphia, N. Y., a north-bound passenger train approaching the station was not stopped soon enough, and the cow-catcher of the engine struck the cars of a freight train which was crossing the main trock just beyond the station; 2 freight cars were derailed.

26th, in Chicago, Ill., collision between a Chicago, Burlington & Quincy freight train and a Chicago & Eastern Illinois freight at the 16th street crossing, derailing and damaging several cars.

31st, at the crossing in Winfield, Kan., a Southern Kansas freight train ran into an Atchison, Topeka & Santa Fe freight, wrecking an engine and 7 cars.

DERAILMENTS.

DEFECTS OF ROAD.

7th, on Florida Railway & Navigation Co.'s road, near Aucilla, Fla., passenger train thrown from the track by a broken rail.

14th, night, on Cincinnati, Wabash & Michigan, at North Manchester, Ind., a trestle gave way under a freight train and the engine and five cars went down into Eel River. An oil tank car exploded and set fire to the wreck, which, with the trestle, was destroyed. Engineer injured.

15th, very early, on Central Pacific, near Winnemucca, Nev., passenger train thrown from the track by a broken rail, wrecking the express and baggage cars.

15th, night, on Denver, Texas & Ft Worth, near Clarenden, Tex., engine, tender and baggage car of a passenger train broke through a bridge which had been undermined by a waterspout; engineer and fireman killed.

15th, on St. Louis, Arkansas & Texas, near Galveston, Tex., engine and 11 cars of a freight train were derailed by a split rail and badly wrecked, killing a large number of cattle; 2 trainmen injured.

18th, on Cincinnati, Hamilton & Dayton, near Carlisle Junction, O., freight train thrown from the track by the spreading of rails, wrecking 11 cars.

26th, p.m., on Fitchburg road, in Boston, Mass., a switching passenger train was by mistake run upon a track resting upon piles, which were insecure and undergoing repairs. Two of the cars were precipitated into 20 ft. of water, and a brakeman was drowned. Several bridge repairers were at work under the floor, but, being warned by the cracking of the timbers, escaped.

26th, on Norfolk & Western, at Crocketts, Va., 2 cars in a freight train derailed by a defective frog.

29th, on Georgia Pacific, near North Birmingham, Ala., passenger train thrown from the track by the spreading of the rails.

DEFECTS OF EQUIPMENT.

7th, on Alabama Great Southern, near East Birmingham, Ala., engine of a freight train was derailed and overturned by the pilot catching on the transverse rail at the crossing of the Louisville & Nashville. Engineer injured by jumping.

9th, on Missouri Pacific, at Centretown, Mo., a tender was derailed by a broken axle.

10th, on Louisville & Nashville, near Columbia, Tenn., 3 cars of a freight train wrecked by the breaking of an axle.

11th, on New York, Lake Erie & Western, near Tuxedo, N. J., several cars of a freight train derailed by a fallen brake-beam.

12th, on New York Central & Hudson River, near Boston Corners, N. Y., 6 cars of a freight train were derailed by the breaking of an axle.

12th, on Norfolk & Western, in Dublin, Va., freight train derailed by a broken wheel.

17th, on Atlanta & West Point, near Whitfield, Ga., car in a freight train derailed by the breaking of an axle.

17th, on New York, Lake Erie & Western, at Sparrowbush, N. Y., 10 cars of a freight train were derailed and badly wrecked by the breaking of an axle.

21st, on Maine Central, near Bath, Me., 3 cars of a passenger train derailed by the breaking of an axle.

22d, on Baltimore & Ohio, near New Belmont, O., 11 cars of a freight train derailed and wrecked by the breaking of a truck; 2 tramps injured.

23d, on New York, Lake Erie & Western, near Bath, N. Y., 9 cars of a freight train derailed and wrecked by the draw-bar of the tender pulling out and dropping upon the track; 1 trainman injured.

26th, on Alabama Great Southern, near Trussville, Ala., a tender of an engine of a freight train was derailed by a loose parallel-rod. The strap by which the rod was fastened broke, letting the rod fall to the ground. The train was running about 20 miles an hour, and the engine was considerably damaged, though not derailed. The derailment of the tender wrecked 8 freight cars. The fireman and 1 brakeman who were on the engine climbed up on the tender, but were thrown off and instantly killed by steel rails on the first car.

26th, night, on Gulf, Colorado & Santa Fe, near Justin, Tex., 10 cars of a freight train derailed and ditched by the breaking of a truck, killing a trainman.

29th, on Southern Pacific, near Pantano, Ariz., some cars of a freight train broke loose, ran back down grade and jumped the track.

31st, on Central of New Jersey, at North Branch, N. J., an axle broke under a car in a coal train while descending a grade and about a dozen cars were piled up in a bad wreck, covering both main tracks.

31st, on Cincinnati Southern, near Somerset, Ky., several cars of a freight train were derailed by a broken truck, just as the train emerged from a tunnel, and thrown over an embankment; 1 trainman killed.

NEGLIGENCE IN OPERATING.

3d, night, on Chicago, Rock Island & Pacific, in Cedar Rapids, Ia., a switch was thrown before the hind trucks of the rear car of a passenger train had cleared it, and the car was derailed, overturned and dragged some distance, slightly injuring several passengers.

11th, on Central of New Jersey, at Phillipsburg, N. J., freight train derailed by a misplaced switch near an overhead bridge, and the engine and several cars, together with the bridge, were wrecked.

21st, on Philadelphia & Reading, at Ashland Pa., the rear portion of a freight train, which had been cut in two "to facilitate descending a steep grade," got away from the trainmen and collided with the forward section, wrecking 16 cars.

23d, on Louisville & Nashville, near Warrior, Ala., freight train derailed at a point where track repairs were in progress.

24th, on Rome, Watertown & Ogdensburg, at Charlotte, N. Y., engine of freight train derailed by a misplaced switch.

27th, on Pittsburgh, Fort Wayne & Chicago, near Canton, O., engine of a passenger train was turned on to a side-track and derailed and upset by a switch which had not been properly closed. Engineer injured by jumping.

31st, night, on New York, Chicago & St. Louis, at Silver Creek, N. Y., a car in a freight train loaded with stone broke down on a high trestle and 7 cars were tipped off and wrecked.

UNFORESEEN OBSTRUCTIONS.

1st, on Chicago & Grand Trunk, near Valparaiso, Ind., freight train ran over some horses and the engine and 10 cars were derailed and badly wrecked; 1 trainman killed and 1 injured.

1st, on New London Northern, near Mt. Tobey, Mass., 3 cars of a freight train were derailed and wrecked by some lumber, which, owing to the breaking of a stake, fell upon the track.

3d, on Northern Pacific, near Miles City, Mont., engine of passenger train was struck by a large mass of earth and overturned, seriously injuring the engneer.

6th, on Joliet, Aurora & Northern, near Plainfield, Ill., engine of a construction train derailed and thrown into the ditch by a plank which had been maliciously placed across the track, killing a laborer and injuring the engineer and several other laborers.

6th, on New Orleans & Northeastern, near Ellisville, Miss., a freight train ran over a cow and the engine and 20 cars were badly wrecked, injuring 3 trainmen and a tramp.

7th, on Alabama Great Southern, near Attala Ala., passenger train ran into a drove of mules and the front trucks of the engine were derailed.

8th, on Louisville, New Albany & Chicago, near Lafayette, Ind., engine and 8 cars of a freight train were derailed and badly wrecked at a point where a large quantity of sand had been washed upon the track by a heavy rain; brakeman killed, engineer and fireman fatally injured.

11th, in Chicago, Ill., a Chicago, Burlington & Quincy yard engine, delivering a train of cars to the Chicago, Milwaukee & St. Paul yards, was derailed by a switch purposely misplaced by strikers or their friends and disabled. The engineer and fireman were both injured by missiles hurled through the cab by the mob.

12th, on Northern Pacific, near Forsyth, Mont., 2 cars of a passenger train were derailed at a washout and thrown over an embankment, injuring 6 passengers.

12th, on Grand Trunk, at Mt. Olivet Cemetery, Mich., passenger train derailed by a purposely misplaced switch. The engine was overturned and wrecked; fireman killed, 1 passenger injured.

16th, night, on Alabama Great Southern, at Jones Spur, Ala., a passenger train running rapidly struck a purposely misplaced switch and ran off the end of a side track, damaging engine, tender and baggage car, and injuring 3 passengers.

18th, on Sylvania road, near Williamson, Ga., passenger train ran into a tree which had been blown down across the track, damaging the engine.

19th, on Chicago, Milwaukee & St. Paul, near Beloit, Wis., engine and 4 cars of a freight derailed and wrecked by a purposely misplaced switch.

19th, on Grand Trunk, at Port Huron, Mich., as a freight train was crossing a bridge a ferryboat ran against it, derailing the train.

20th, on East Tennssee, Virginia & Georgia, at Blue Springs, Tenn., a passenger train was derailed by a switch which had been maliciously misplaced by two negroes, who were soon after arrested. The locomotive went over an embankment; engineer killed, fireman fatally injured.

23d, on Atlantic & Pacific, near Albuquerque, N. M., engine of passenger train derailed at a washout.

23d, on Chicago, Milwaukee & St. Paul, near Red Wing, Minn., passenger train ran over a cow; three cars were thrown down a 20-ft. embankment, and 1 passenger was killed and 2 injured.

24th, on Pittsburgh & Lake Erie, near Port Royal, Pa., freight train ran into a mass of rock and earth which had been loosened by heavy rains and fallen down upon the track, wrecking engine and 8 cars.

25th, on Denver & Rio Grande, near Sedalia, Col., engine of passenger train derailed at a point where the roadbed had been impaired by a washout.

28th, on Batesville & Brinkley, engine of passenger train derailed by a tree which had fallen across the track, causing explosion of the boiler. Engineer killed.

31st, on Kansas City, Ft. Scott & Memphis, near Tyronza, Ark., passenger train ran over a cow, and the engine and baggage car were derailed and damaged, killing the fireman.

UNEXPLAINED.

1st, on Gulf, Colorado & Santa Fe, near Plantersville, Tex., construction train derailed, injuring a laborer.

1st, on Ferris & Cliff House Railroad, near San Francisco, Cal., passenger train, consisting of engine and one car, derailed at a sharp curve and thrown over against an embankment, doing considerable damage and slightly injuring several passengers.

1st, on Northern Pacific, near Gold Creek, Mont., 3 rear cars of passenger train thrown from the track and overturn in the ditch, falling about 10 ft.; 2 passengers seriously and a dozen others more or less severely injured.

3d, on Elmira, Cortland & Northern, in Elmia, N. Y., passenger train derailed.

3d, on Columbus & Western, near Alexander City, Ala., 6 cars of a freight train derailed and wrecked.

6th, on Old Colony, at Fall River, Mass., 4 cars of a circus train were derailed and badly wrecked; 2 circus men injured.

7th, on East Tennessee, Virginia & Georgia, at Tecumseh, Ala., passenger train derailed and engine and several cars damaged, killing the fireman and injuring several passengers.

9th, on Chicago, Rock Island & Pacific, near Cameron, Mo., engine, tender and 3 cars of a construction train were derailed and tipped off a bridge, falling 30 ft. to the ground, and badly wrecked; engineer and fireman killed, 1 brakeman injured. The engine was running backwards.

11th, on Kansas City, Memphis & Birmingham, near Ensley City, Ala., construction train, consisting of engine and 2 cars, was thrown from the track and wrecked; engineer and 2 laborers injured.

11th, on Central of Georgia, near Barnesville, Ga., several cars of a freight train were derailed and damaged.

12th, very early, on Virginia Midland, near Orange Court House, Va., a passenger train, consisting of engine, tender, baggage car, 2 coaches and 3 Pullman sleepers, broke through a high trestle, and, with the exception of the 2 rear cars, was piled up in a very bad wreck, in which 4 trainmen and 5 passengers were killed and 11 trainmen and 11 passengers injured. There were indications of a car having been derailed just before reaching the trestle, and, also, that the timbers of the structure had decayed.

13th, on Georgia Pacific, near Coalburg, Ala., a freight train broke through a trestle, wrecking engine and 3 cars; 4 trainmen and a man riding on the engine were injured.

14th, on Louisville & Nashville, at Cunningham, Ala., 8 cars of a freight train moving on to a siding were derailed and thrown into a creek.

15th, very early, on Burlington & Missouri River, near Lincoln, Neb., engine and a passenger car sent out to assist at a wreck were derailed at a switch and overturned in the ditch.

15th, on Louisville & Nashville, near Strasburg, Ala., freight train derailed and 15 cars wrecked.

18th, on Red Mountain Railroad, near Chattanooga, Col., engine of passenger train derailed.

18th, on Atchison, Topeka & Santa Fe, at Sulzbacher, N. M., freight train derailed and the engine and all cars were piled up in a very bad wreck, killing 3 trainmen and injuring one trainman and a tramp

18th, on St. Louis Bridge & Tunnel road, in St. Louis, Mo., engine and 3 cars of a freight train derailed at a switch and badly wrecked A sand house and several shanties were also demolished. Two trainmen killed and 1 injured.

19th, on San Antonio & Aransas Pass, at Reid's Switch, Tex., 15 cars of a stock train derailed and ditched; brakeman injured.

19th, on Burlington & Missouri River, in Lincoln, Neb., engine and several cars of passenger train derailed.

20th, on Southern Pacific, near Painted Cave, Tex., engine and several cars of a freight were derailed and ditched, injuring a fireman.

21st, on Kanawha & Ohio, near College Hill, O., engine of freight train derailed on a trestle and the entire train, with the structure, were piled up in a bad wreck; engineer hurt.

22d, on Cleveland & Pittsburgh, at Bayard, O., 12 cars of a freight train going on to a siding derailed.

22d, on West Shore, near Fort Plain, N. Y., tender of freight engine and several cars derailed.

22d, on New York & New England, near Bristol, Conn., several cars of freight train derailed.

23d, on Atlantic & Pacific, near Flagstaff, Ariz., passen train derailed and several cars thrown down an embankment; 2 trainmen injured.

24th, on Northern Pacific, near Pasco, Wash. Ter., freight train derailed.

24th, on Prescott & Arizona Central, near Prescott Junction, Ariz., engine of mixed train derailed and wrecked; engineer hurt.

24th, on Pittsburgh, Fort Wayne & Chicago, at Wooster, Ohio, engine and six cars of a freight train derailed and wrecked; 3 trainmen injured.

25th, on Philadelphia & Reading, in Philadelphia, Pa., passenger train derailed at a switch; fireman slightly injured by jumping.

26th, on St. Louis & San Francisco, at Cluster, Ark., empty engine descending a grade blew out both cylinderheads; the speed became unmanageable and the engine was soon derailed and wrecked, badly injuring the fireman. It would appear from the account that the engine had no hand or power brakes.

27th, on Western & Atlantic, in Atlanta, Ga., 2 cars of a switching freight train derailed.

31st, on Louisville & Nashville, near Columbia, Tenn., freight train derailed.

OTHER ACCIDENTS.

3d, on Missouri Pacific, at Jefferson City, Mo., forward truck under engine of passenger train broke just as the train drew up to the station.

5th, on Alabama Great Southern, near Cottondale, Ala., the rear axle under tender of passenger train broke, tearing away the steps of the following car.

6th, very early, on Alabama Great Southern, near Carthage, Ala., engine of passenger train broke both parallel-rods.

11th, on St. Louis, Iron Mountain & Southern, at Belmont, Mo., engine of freight train exploded its boiler, seriously injuring the fireman.

11th, on New York, Lake Erie & Western, near Lordville, N. Y., a car of a freight train was found to be on fire. It was cut out from the train in season to save the other cars but was itself destroyed.

13th, on Philadelphia & Reading, in Philadelphia, Pa., a passenger train ran over a misplaced switch and into a coal shed, disabling the engine.

19th, on Buffalo, Rochester & Pittsburgh, near Pavilion, N. Y., engine of passenger train broke a parallel rod, the loose end demolishing one side of the cab.

25th, on Port Jervis & Monticello, near Monticello, N. Y., a car in a circus train, containing two elephants and other animals, caught fire and burned up. Two circus men were injured by jumping from the burning car.

31st, on Philadelphia & Reading, in Philadelphia, Pa., engine of passenger train exploded its boiler, killing engineer and fireman.

31st, on Delaware, Lackawanna & Western, near Scranton, Pa., engine of freight train exploded its boiler, fatally injuring engineer and fireman.

A summary will be found on another page.

TECHNICAL.

Manufacturing and Business.

G. W. De Rochemont is building an addition to his factory at Milford, Mass., for the manufacture of brass trimmings for street and steam cars.

The A. French Spring Co., Limited, Pittsburgh, Pa., announces that the recent destruction by fire of one of their mills in the elliptic department will cause no delay in the execution of orders, as their No. 1 mill is a duplicate of the one destroyed.

The New York, Lake Erie & Western will soon put in new machinery at the Jersey City depot for lighting the yards by electricity. The company will then have 900 incandescent, and 95 arc lights of 2,000 candle power each at the depot.

The Moore Manufacturing & Foundry Co., of Milwaukee, Wis, has been organized to succeed the Moore Manufacturing Co., of Chicago, Ill. The new company is erecting at Milwaukee an extensive plant for the manufacture of its hardware specialties, and will within a few weeks be prepared to solicit contracts for light and medium weight gray iron castings, light machine work, forging and japanning. It is expected to have the new plant completed in October. The Chicago office is at 51 Franklin street.

Messrs. Riehlé Bros., proprietors of the Scale & Testing Machine Works, of Philadelphia, have arranged with the new firm of the Robert W. Hunt & Co. Bureau of Inspection Tests and Consultation, Nos. 631 and 633 "The Rookery," Chicago, to represent them in the testing machine branch of their business in the Northwest.

The Inter-state Railroad Construction Co., with offices at Lawrence, Kan.; Denver, Colo., and New York City, has filed articles of incorporation in several Western states. The capital stock is $500,000. The directors are as follows: C. C. Thompson, of Chicago; J. D. Bowerstuk, S. W. Sawyer, Edwin Brown and George Teis, of Lawrence, Kan.; D. P. Marsh, of Omaha; David Keiller and George H. Clark, of Kansas City, and W. B. Henry, of Olathe, Kan. The object of the company is the construction and equipment of railroads.

The Hartford Switch Co. has been organized at Birmingham, Ala., with a capital stock of $100,000, to manufacture railroad switches, frogs and other specialties. J. A. Montgomery is President and J. T. Hart is Secretary.

The Fort Scott Cement Manufacturing Co., of which Mr. R. P. McCormick a Civil Engineer and Railroad Contractor, of Kansas City, Mo., is President, has completed —two miles north of Ft. Scott, Kan.—a factory capable of turning out 600 barrells of cement daily. Tests of the products of the works have proved very gratifying to the owners of the enterprise, who claim that the cement equals the English Portland cement, or the Louisville cement, though in some work it might not be desirable, as it takes somewhat longer for it to harden. The factory building is three stories in height and is equipped with the best machinery; the property on which the works are situated covers a rich vein of coal, from which source the fuel for the works will be obtained. The principal office of the company is at room 21, Water-Works Building, Kansas City.

Sealed tenders will be received at the office of the Department or Railways and Canals, at Ottawa, until Oct. 23, for the formation and construction of a canal on the Canadian side of the St. Maria River, through the Island of St. Mary. The work will be let in two sections, one of which will embrace the formation of the canal through the island, the construction of locks, etc. The other, the deepening and widening of the channel-way at both ends of the canal, construction of piers, etc.

Iron and Steel.

Contracts have been let by the Seattle, Lake Shore & Eastern to the Moss Bay Iron & Steel Co., for 30,000 tons of steel rails; delivery is to commence next July. The Moss Bay Iron & Steel Co. is now constructing works on Lake Washington, five miles from Seattle, which, when completed, will probably be the largest west of the Mississippi. Their iron supply is in Moqualmie Pass, about 30 miles from the works.

Part of the plant of the North Chicago Rolling Mill Co., at South Chicago, is to be temporarily shut down. About 1,500 men are affected. The blast-furnaces will continue in operation. The cause is due to the lack of orders. The works will probably resume in a few weeks.

The entire property of the Sheffield Land, Iron & Coal Co., Sheffield, Ala., has been sold to Eastern parties for $1,750,000 or $2,000,000, about half of which is to be in cash.

McClure & Schuler, blast-furnace engineers and contractors, at Pittsburgh, have closed a contract with the Williamson Iron Co., of Birmingham, Ala., for the erection of three of their Massicks & Crooke's fire-brick hot-blast stoves of the three-pan type. They have also contracted with the North Chicago Rolling Mill Co. for a plant of three 18 × 65 stoves of the same type, to be erected at one of the company's furnaces at Milwaukee, Wis.

The Chicago Forge & Bolt Co. has been awarded the contract for part of the Ashland avenue viaduct in Chicago. The company has also received a large order for bolts for the Ohio & Mississippi and for the new West Side Chicago Cable road.

Arrangements are being made at the Benwood Iron Works, Wheeling, W. Va., to prepare the furnace in the forge department for immediate resumption. This department has been shut down since August, 1887.

The new machinery in the Wheatland Rolling Mill, at Sharon, Pa., was tested Aug. 13, and worked satisfactorily. It is said that as soon as a few more repairs are made, the mill will start up and manufacture bar iron.

The large rolling-mill and nail factory of Taggart & Co., at Northumberland, Pa., resumed operations Aug. 14, and will soon be placed on double-turn. The mill had been idle for sixteen months.

The Columbia Rolling-Mill will remove its works from New York to Jersey City, N. J., where a new building covering half a block of ground has been built for it. The main office will be in New York.

Contracts for Goliath Rails.

Contracts have just been let for 8,000 tons of Goliath rails required for the Belgian state railroads. The lowest tender was that of the Steel Works Co. of France, which offered to supply 2,000 tons at £4 7s. 6. per ton. Orders for the remaining 6,000 tons were divided between the John Cockerill Co., the Angleur Steel Works Co., and the Ougrée Works Co.—*Railway Press.*

The Nicaragua Canal.

At the Cleveland meeting of the American Association for the Advancement of Science papers on the Nicaragua Canal were read by Mr. Peary and Commander H. C. Taylor. It was said that during the six months of the survey, the 200 men engaged enjoyed excellent health, although their work was carried on mostly on the woody slope east of the lake. The construction of the canal will require the labor of 10,000 men for five years. Fifteen thousand men could be obtained, if desired, at prices below the standard here. Building materials are abundant on the spot. The neighborhood governments are friendly to the scheme The entire route, both east and west of the lake, has been resurveyed. In all, 500 miles of line were run in the eastern portion. The length has been reduced a quarter of a mile, and the radius of curvature increased from 4,000 to 4,900 ft. In the western division, the Rio Grande is to be dammed, forming a lake and reducing the amount of canal navigation five and one quarter miles. Various useful modifications are proposed The total length from ocean to ocean remains 169.8 miles, but the length of canal navigation is reduced from 40.2 miles to 28.9. At Nicaragua there are two practical routes of nearly equal cost, both of which will be ultimately required for increased traffic. The number of locks is reduced to five or six. The question is not now, as it was a year ago, when the project was laid before the association, "Shall the canal be built?" but when it will be built. The proposed modification will reduce the price of construction $10,000,000 or $15,000,000, bringing it down to $50,000,000 or $55,000,000. Assurance has been received that the money is forthcoming; the only delay is to obtain a charter from Congress.

Numerous borings have made an end of the bottomless swamps, semi-liquid quicksands, and numerous other subterranean bugbears which have been conjured up against this route, and have shown that in no portion of either line is there any trouble about foundations. In the worst swamps the boring implement, after sinking with its own weight perhaps ten, or at most 15 ft., reached a stratum of firm red clay extending to bed rock.

The Jeffersonville Bridge.

The Board of Engineer Officers, appointed to examine and report upon the plans of the proposed bridge across the Ohio River at Louisville, Ky., submitted by the Louisville & Jeffersonville Bridge Co., has made a long report carefully discussing the conditions. The conclusions are as follows:

First. That the proposed bridge be moved further up the river, to some point at or above Wall street, in Jeffersonville, and that it be built with a channel span near the Indiana shore of 500 ft. in the clear.

Second. If the present location of the bridge be accepted, the Board, while strongly disapproving of it, recommends that there be a span at least 650 wide in the clear near the Indiana shore, with the Indiana pier at low water mark, and a span at least 400 ft. in the clear near the island shore, with the Kentucky pier at low water mark on the island.

Car Heating.

We are informed that the Martin system of continuous heating has been adopted on the Lake Shore & Michigan Southern. The works of the Martin Company are running night and day to fill orders for equipment. This system is the standard throughout the Vanderbilt lines.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Burlington & Quincy, quarterly, 1 per cent., payable Sept. 15.

Cincinnati, Indianapolis, St. Louis & Chicago, quarterly, 1¼ per cent., payable Sept. 15.

Illinois Central, semi-annual, 3½ per cent., payable Sept. 1.

Maine Central, 3 per cent., payable Aug. 15.

North Pennsylvania, quarterly, 2 per cent., payable Aug. 25.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Chicago & Atlantic, annual meeting, Huntington, Ind., Sept. 6.

East Tennessee, Virginia & Georgia, special meeting, Knoxville, Tenn., Oct. 18.

Nashville, Chattanooga & St. Louis, annual meeting Nashville, Tenn., Sept. 12.

Northwest & Florida, special meeting, Montgomery, Ala., Aug. 30.

Selma & Cahaba Valley, special meeting, Selma, Ala., Aug. 27.

Sheffield & Birmingham Coal, Iron & Railway Co., special meeting, Sheffield, Ala., Aug. 24.

Vincennes, Oakland City & Owensboro, annual meeting, Boonville, Ind., Sept. 3.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Roadmasters' Association of America* will hold its sixth annual convention at the Metropolitan Hotel, in Washington, D. C., commencing at 9 a. m., Tuesday, Sept. 11, and continuing in session three days.

The *National Association of General Passenger and Ticket Agents* will hold its fall meeting at the United States Hotel, in Saratoga, N. Y., Sept. 18.

The American Society of Mechanical Engineers will hold its eighteenth convention and ninth annual meeting in Scranton, Pa., beginning Monday evening, Oct. 15.

The *Association of North American Railroad Superintendents* will hold its next meeting at the Southern Hotel, St. Louis, beginning Sept. 19.

The *Master Car and Locomotive Painters' Association* will hold its nineteenth annual convention at the Hollenden Hotel, in Cleveland, O., commencing Sept. 12, at 10 o'clock a. m.

The *American Institute of Mining Engineers* will hold its fifty-second meeting at Buffalo, N. Y., beginning on Tuesday evening, Oct. 2, 1888.

The *American Association of Railway Chemists* will hold its next meeting in Baltimore, Md., in October

The *New England Railroad Club* meets at its rooms in the Boston & Albany passenger station, Boston, on the second Wednesday of each month.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, on the third Thursday of each month.

The *Western Railway Club* will hold its next meeting on the third Wednesday in September, at the Grand Pacific Hotel in Chicago.

The *Central Railway Club* meets at the Tifft House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The *American Society of Civil Engineers* holds its regular meetings on the first and third Wednesday in each month, at the House of the Society, 127 East Twenty-third street, New York.

The *Boston Society of Civil Engineers* holds its next regular meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m. on the third Wednesday of September.

The *Western Society of Engineers* holds its regular meet-

ings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

The *Engineers' Club of Philadelphia* will hold its next meeting in Philadelphia, Oct. 6.

The Engineers' Society of Western Pennsylvania will hold its next meeting at Pittsburgh, Sept. 18.

The Engineers' Club of Kansas City will hold its next regular meeting Sept. 3.

Civil Engineers' Association.

This association will hold a meeting in New London, Friday, Aug. 24, at which a paper on the "Thames River Bridge" will be read by Col. J. Albert Monroe, resident engineer of the work.

Montana Society of Civil Engineers.

A regular meeting was held July 21. The Secretary read a letter from J. K. Toole, member of Congress from Montana, acknowledging the receipt of the memorial to Congress from the Society, praying for the reorganization of the National Public Works. The memorial had been duly presented and the Society was insured of the hearty sympathy of the delegate in Congress. The communication from the Western Society of Engineers on the matter of bridge reform was transmitted to each member of the Society with the request that they forward their views in time to be canvassed at the meeting of Aug. 18. The question of the relative effective power produced by the locomotive when pulling and backing was discussed at considerable length. There was discussion, also, on the subjects of the Wickes Tunnel, which, it is expected, will be completed about the middle of September; upon railroad trestles, and upon the use of five rails on sharp curves.

PERSONAL.

—Sir Henry Tyler, the President of the Grand Trunk, of Canada, and Mr. Thomas Baring, the well-known London banker, are now on a visit to the country.

—It is stated that Col. J. C. Fawcett will retire from the Presidency of the Louisville, St. Louis & Texas about Sept. 1, and will probably be succeeded by Vice-President and General Manager W. V. McCracken, of New York.

—Mr. R. H. Soule is expected to arrive in New York about Aug. 25 from his brief European trip. It will be remembered that he resigned the office of General Manager of the the Erie April 30 and sailed for Europe shortly afterwards.

— Acting General Manager Kimball, of the Union Pacific, has been confined to his bed at Omaha for a week by nervous prostration. The first cause was a severe cold, which was aggravated by overwork. Mr. Kimball is now reported as being decidedly better.

—Mr. George E. Merchant has resigned the position of General Manager of the Buffalo, Rochester & Pittsburgh, which he has held for the past seven years, to assume the Presidency of the Rochester & Pittsburgh Coal & Iron Co., to which he was elected last April. Mr. Merchant has held several important offices in the freight and passenger departments of the Illinois Central, and he has also been superintendent of several divisions of the Chicago, Milwaukee & St. Paul. He will be succeeded as General Manager by W. A. Baldwin, Vice-President.

—Gouverneur Morris died at his home at Bartow-on-the-Sound at 9 a. m. Aug. 20. He was a son of Gouverneur Morris, of Morrisania, who was a member of Congress from New York, Chief Clerk to the Revolutionary Department of the Treasury, Minister to France, Senator from New York, and one of the projectors of the Erie Canal. The son was born in Morrisania in 1813, and became one of the earliest railroad projectors and constructors of the United States. His railroad career began in the early days of the New York & Harlem Railroad, about 1838, and terminated with his resignation of the presidency of the Vermont Valley Railroad in 1880.

He has been connected with the Erie and New York Central roads; he served as President of the Harlem, and built the Port Morris branch of that road. He was one of the originators of the Illinois Central and the Iowa system of roads, and an early advocate of the Pacific roads.

—Mr. Samuel Noble, of Anniston, Ala., died in that city after a short illness on Aug. 14. Mr. Noble was one of the most distinguished of the pioneers in the industrial development of the South. He was born in Pennsylvania, and early engaged in the manufacture of iron and machinery. Shortly before the war he removed with his father to Rome, Ga., where they successfully established and conducted an extensive foundry and machine shop. With the assistance of Gen. Daniel Tyler, Mr. Noble and his brothers founded the beautiful and busy town of Anniston, Ala., and the industries which surround and support it. It began with the formation of the Woodstock Iron Co. and the erection of a charcoal iron furnace in 1873. More than $11,000,000 of capital is represented in the various industries of the district, which employ between 5,000 and 6,000 workmen. Mr. Noble was Vice-President of the Anniston & Atlantic R. R., and Vice-President and General Manager of the Anniston & Cincinnati.

ELECTIONS AND APPOINTMENTS.

Alexandria & Charleston.—The following are the directors and officers of the road: Directors—Gen. Eppa Hunton and Peyton Randolph, Washington; G. C. Halland, Danville, Va.; S. Kipworth Wilmer and George C. Jenkins, Baltimore: J. S. B. Thompson and Robert Andrews, Alexandria. Officers: President, Hon. John S. Barbour, Washington, D. C.; Treasurer, J. S. B. Thompson, Alexandria, Va.; Secretary, John R. Reavis, Alexandria.

Baltimore & Eastern Shore.—The following are the officers of this Maryland Co: Joseph B. Seth, President; E. E. Jackson, Treasurer; Theophilus Tunis, Secretary. The general office is at Easton, Md.

Bradford, Eldred & Cuba.—W. W. Atwood has been appointed superintendent, with office at Wellsville, N. Y.

Buffalo, Rochester & Pittsburgh.—W. A. Baldwin, Vice-President, will hereafter perform the duties of General Manager, vice George E. Merchant, resigned.

Chattanooga, Rome & Columbus.—Col. J. R. Shaler has been appointed Traffic Manager, with headquarters at Rome, Ga.

Chicago & Alton.—W. K. Morley, Superintendent of Telegraph, has been appointed Superintendent of the St. Louis & Kansas City Division, with office at Roodhouse, Ill., to succeed S. D. Reeves, resigned. Appointment to take effect Sept. 1.

Chicago & Northwestern.—J. S. Barrow has been appointed Assistant General Ticket Agent, appointment to date from Aug. 1.

Fulton County Extension.—The following directors and officers were elected at the annual meeting in Lewiston, Ill.: Directors: S. H. Mallory, T. M. Stuart, E. A. Temple and D. J. Thayer, Chariton, Ia.; A. Mallory, Creston, Ia.; Jno. A. Gray, Henry Phelps, Moses Turner and A. C. Atherton, Lewistown, Ill. Officers: S. H. Mallory, President; D. J. Thayer, Vice-President and Secretary; F. R. Crocker, Treasurer.

Fulton County Narrow Gauge.—At the annual meeting held at Lewistown, Ill., Aug. 14, the following directors were elected: S. H. Mallory, Joseph Braden, T. M. Stuart, E. A. Temple, D. J. Thayer, Chariton, Iowa; A. Mallory, Creston, Ia.; Henry Phelps, Moses Turner, John A. Gray, J. C. Worley, J. D. Temple, and A. C. Atherton, Lewistown, Ill. The directors elected the following officers: S. H. Mallory, President; Henry Phelps, Vice-President; F. R. Crocker, Treasurer; D. J. Thayer, Secretary.

Genesis & Obed River.—The following are the officers of this company: J. B. Holmes, Chief Engineer; Capt. Lina Beecher, General Manager; C. A. Seaver, General Superintendent. The general office is in Genesis, Tenn.

Georgia, Carolina & Northern.—Maj. John C. Winder has been appointed General Manager, and F. W. Clarke has been appointed General Passenger Agent, with office in Raleigh, N. C.

Lake Shore.—The following officers have been elected: C. A. Busiel, President, Laconia, N. H.; J. Frank Webster, Treasurer, Concord, N. H.; Frank S. Streeter, Secretary, Concord.

San Luis Valley.—The following are the directors of this new Colorado company: G. Pierrepont Davis, of Hartford, Conn.; John P. Brink, of Denver, Col.; John B. Deilman and R. B. Wallace, of Monte Vista, Walter H. Graves, of Rio Grande County, Henry M. Mingay, of Saguache, and L. B. Eskridge, of La Jara, Colo.

Sonora, Sinaloa & Chihuahua.—The following are the officers and directors of the road: George H. Sisson, New York, President; James A. Williamson and John A. Lee, Albuquerque, Vice Presidents; Willard S. Strickler, Albuquerque, Secretary; Charles H. Dane, Deming, Treasurer; Sigmund Lundauer, Deming, Auditor; James C. Tiffany, Purchasing Agent. Board of Directors: J. A. Williamson, John A. Lee, A. L. Warren, S. Lundauer, G. Wormser, Louis Huller, C. H. Dane, G. H. Sisson, Willard S. Strickler, H. B. Ferguson, James C. Tiffany. The headquarters of the road will be at Deming, New Mexico.

South Norfolk.—The following are the officers of this Canadian company: A. McCall, Simcoe, Ont., President; Superintendent of Construction, Alexander McDonnell, Toronto; E. Daly, Chief Engineer.

Springfield & Connecticut.—The following are the directors of this new Massachusetts company: J. H. Appleton, Hinsdale Smith, Charles Marsh and H. P. Stone, of Springfield, Mass.; H. S. Hyde, of West Springfield; W. H. Barnum, of Lime Rock.; Henry Gay, of West Winsted, Conn.; Jeffrey O. Phelps, of Simsbury, Conn., and John W. Brock, of Philadelphia, Pa. T. M. Brown was made Secretary and Charles Marsh Treasurer.

Stockton, Fresno & Southern.—The directors of this new California company are Henry L. Davis and H. B. Hunt, of San Francisco, and Thomas R. Hayes, A. T. Murvey, Daniel E. Hayes, George H. Collins and L. M. Hickman, of Oakland. Thomas R. Hayes has been elected Treasurer.

Western, of Alabama.—At the recent annual meeting, held in Atlanta, Cecil Gabbett was re-elected President, and H. M. Gabbett was re-elected Secretary and Treasurer.

OLD AND NEW ROADS.

New Companies Organized.—Allentown Terminal.—Cleveland, Chagrin Falls & Northern.—Springfield & Connecticut.—Stockton, Fresno & Southern.—Wyoming & Eastern.

Allentown Terminal.—Chartered in Pennsylvania to construct a road three miles long, extending from a point in Hanover township, on the Lehigh & Susquehanna, to a point on the same road opposite the Allentown Iron Works. The capital stock is $450,000.

Alexandria & Charleston.—A party is now in the field making a reconnoisance of the route of this proposed road, but the surveys will not be commenced until October. The company has been chartered to build a road from Alexandria, Va., to Charleston, W. Va., a distance of about 300 miles, but it is the present intention of the company to build only from Strasburg, Va., on the Virginia Midland, and the Baltimore & Ohio, to coal and lumber lands in Central West Virginia, giving these lands an eastern outlet.

Anniston & Cincinnati.—The tunnel in the Calone Mountains, 30 miles from Gadsden, Ala., is rapidly approaching completion, and will be finished about Sept. 15, and trains will be running through the tunnel by Oct. 1. The road is at present in operation between Anniston and Attala, Ala., 36 miles, a transfer being made at the tunnel.

Atlanta & Florida.—At the annual meeting in Atlanta last week, the president was authorized to place a surveying corps in the field to survey an extension southward from the present terminus at Fort Valley, Ga. The Georgia Improvement Co. has an option on the contract for building the extension. H. S. Collier, Chief Engineer, will immediately organize the party.

Baltimore & Eastern Shore.—The company is now ready to receive bids for grading and tracklaying the 53 miles of road, and also for 1,300 ft. of trestling. Work is to begin Sept. 1. The grading is light. Joseph B. Seth, Easton, Md., is President.

Batesville & Brinkley.—The contract for constructing the six-mile branch from Howells, Ark., to the Cash River, has been let to D. O'Leary, Little Rock, Ark.

Birmingham Mineral.—Tracklaying on the 13 mile branch from Gate City to Trussville, Ala., is expected to be finished this week. On the branch between Village Springs and Chepultepec, 19 miles, the grading is making rapid progress, and tracklaying will probably be begun early in September at Village Springs.

Brookfield.—Grading on this short New York road has been completed from Brookfield for a distance of about 3½ miles toward North Brookfield. About 200 men are at work on the road, and it is thought that the entire seven miles will be opened for traffic in September.

Camden & Northwestern.—This line is being built from Camden, Ark., 9½ miles, to a vein of brown coal of the following analysis:

Carbon	50.15	Lime	3.15
Hydrogen	4.15	Iron	0.05
Nitrogen	0.45	Sulphuric acid	0.30
Oxygen	20.60	Phosphoric acid	0.15
Water	16.95	Loss	0.20
Silica	2.15		
Alumina	1.70		100.00

Canadian Pacific.—The company has agreed to extend its line south from Vancouver through New Westminster, B. C., to a connection at the boundary line with the Northern branch of the Seattle, Lake Shore & Eastern.

Central of Georgia.—The extension of the Eufaula & East Alabama road from Clayton, to Ozark, Ala., has now been completed from Clayton for 31 miles, leaving 9 miles to reach Ozark. The entire extension will probably be opened early in September.

The contract has been let to L. McLain, of Sanford, Fla., for constructing seven miles of the Savannah & Western from the junction with the main stem of the Central of Georgia at a point 17 miles from Savannah.

Chesapeake & Ohio.—The survey was made this week for the track to connect this road with the Richmond & Allegheny in Richmond, Va. It will be necessary to lay about 2,500 ft. of track to connect the roads.

Chicago, Rock Island & Pacific.—The citizens of Fort Dodge, Ia., have petitioned the State Railroad Commissioners to compel the company to operate its road from Tora to Fort Dodge. Their petition states that 500,000 acres of land, a portion of which was granted by the state, were to aid in the construction of a road from Des Moines to Fort Dodge; that the terms of the grant were accepted by the company; that in addition to the grant of land, the town of Fort Dodge voted ground for the right of way, on which to erect a station in Fort Dodge. But the company had abandoned its road between Tora and Fort Dodge, taken up its tracks, removed its bridges, and ceased to operate that part of its road.

Chicago, St. Paul & Kansas City.—The company last week commenced suit at St. Joseph, Mo., against the Kansas City, St. Joe & Council Bluffs road, to compel the latter to allow the use of its main line in St. Joseph, as ordered by an ordinance of the Council recently. The road will be unable to reach the Union Depot unless it is successful in the suit.

Chowan & Southern.—The road last week purchased $50,000 worth more of property in Norfolk, making in all $150,000 of water front purchased at that city for terminal facilities in the past two months. In addition to this the company has recently purchased the riparian rights of another piece of property which gives the company an entire frontage of three-fourths of a mile on the harbor.

Cincinnati, Richmond & Chicago.—This line, heretofore operated by the Cincinnati, Hamilton & Dayton, has been transferred to the Chicago, St. Louis & Pittsburgh Co., and will hereafter be operated by that company as a division of the Little Miami. The Pennsylvania already controls a line from Richmond into Chicago. The acquirement of this road gives them a line under their own control between Cincinnati and Chicago and Indianapolis and Chicago. The Cincinnati, Richmond & Chicago was originally chartered as the Eaton & Hamilton road in 1847, and reorganized under its present name in 1866. It was leased to the Cincinnati, Hamilton & Dayton in 1869, the lessees to pay interest on bonds and balance of net earnings to lessors. The road extends from Richmond to Hamilton, O., connecting at the latter point with a branch of the Pennsylvania, recently built from Hamilton to the Little Miami division at Red Bank.

Cleveland & Canton.—A meeting of the stockholders will be held Sept. 5 to arrange for a lease of the Canton & Waynesburg to this road.

Cleveland, St. Louis & Kansas City.—A survey was commenced this week from a point opposite Alton, Ill., to St. Charles, Mo., near the mouth of the Missouri River.

Covington & Macon.—Tracklaying has now been completed to Watkinsville, about seven miles south of Athens, Ga., and has been suspended owing to the refusal of the city authorities to grant the road right of way through the city, they claiming they have not the legal authority.

Decatur, Chesapeake & New Orleans.—Ground was broken at Shelbyville, Tenn., last week for the section of the road between Shelbyville, Tenn., and Decatur, Ala., 76 miles. Grading will be completed as soon as possible.

Denver & Rio Grande.—Carlile, Price & McGavock, of Pueblo, Col., have received the contract for grading for the double track between Denver and Pueblo. They will grade nine miles out of Denver, seven miles out of Pueblo and five miles north and south of Colorado Springs. A large grading camp has been established near Colorado Springs and work will begin at once.

Duluth, Red Wing & Southern.—Keating Bros. & Co., of Pittsburgh, have sublet the contract for grading the first five miles from Red Wing, Minn., to Andrew Danielson and H. E. Perkins, of Red Wing, and D. L. Billingsly, of St. Paul, and work was commenced this week. Thomas Berry, of the firm of Keating Bros. & Co., will have charge of the work along the line.

Genesis & Obed River.—The contracts for building this road from a point near Genesis, Tenn., to a connection with the Cincinnati Southern near Kismet, Tenn., a distance of 15 miles, will be let Oct. 1. The locating survey for the road has now been completed. Capt. L. Beecher, of Genesis, Tenn., is general manager.

Georgia, Carolina & Northern.—The road has now been completed from Monroe toward Chester, S. C., for a distance of 32 miles, and this section will be opened for traffic very soon. Contracts for building the division between Chester and Athens, Ga., will soon be let.

Grand Trunk.—It is announced that the company has made arrangements to extend the Michigan Air Line Division in order to form a short line between Detroit and Chicago independent of the Wabash. Arrangements are also being made to connect the Grand Trunk system with the Toledo, St. Louis & Kansas City, reaching St. Louis and the Southwest by a route about the same length as that of the Wabash.

Hartford & Connecticut Western.—The elevated Union station at Asylum street, in Hartford, will leave this road alone on the old level, and it will build an independent station, which will be located on Spruce street, north of Church. The plans are for a brick building, trimmed with light-colored granite, 100 × 28 ft., two stories and an attic, with a domed tower at the southeast corner. The second floor will be occupied by the offices of the company, while the lower floor will be divided in the usual manner. A covered platform, 12 ft. wide, will run around the building.

Hodgenville & Glasgow.—Surveyors are now running a line for this proposed railroad from Hodgenville, La Rue County, Ky., and Glasgow, Barren County, Ky., a distance of 65 miles. The road is to be built by private subscriptions, and $125,000 is said to be already pledged in Barren and Hart counties alone. The principal parties in the project are Hon. D. H. Smith, of Hodgenville, Ky., and Hon. J. T. Thompson, of Harrodsburg, Ky.

Houston, East & West Texas.—A plan for the reorganization of the company has been formulated. The claims against the company amount to $2,345,000, including funded and floating debt. It is proposed that the capital stock shall remain at $10,000,000, the amount issued to be limited to $20,000 per mile. Forty-year consolidated first mortgage 5 per cent. gold bonds are to be issued at the rate of $18,000 per mile, bearing interest from Nov. 1, 1888. The proceeds from the sale of 75,000 acres of land are to be applied to the retirement of the bonds at par and interest. Coupons to Nov. 1, 1888, are to be funded into consols, two shares of stock to be given with each $1,000 bond so applied. Present first mortgage bonds will be scaled from 7s to 5s, or they may be exchanged for consols at par, with two shares of stock thrown in. Lien claims are to be paid in consols. Notes secured by second mortgage bonds are to be allowed 6 per cent. interest to Nov. 1 next, and receive consols at par for principal and interest, with two shares of stock thrown in with each bond. Other claims are to be paid in stock at par. The second mortgage bonds are to be retired. The remainder of the consols to be issued on the present 192 miles of road are to be applied to the widening of the gauge and other uses of the company, including the retirement of $25,000 receivers' certificates, court costs, etc.

Illinois Central.—This road will soon occupy its new depot at Sioux City, which is said to be one of the finest in the West.

Kansas City & Sabine Pass.—It is thought grading will be commenced shortly on that part of the road between Pierce City and Lamar, Mo., 41 miles, and that it will be completed before winter. R. P. McCormick & Co., of Kansas City, have been awarded the contract for building this part of the road.

Kansas City & Southern.—The extension from East Lynne to Kansas City, Mo., 47 miles, recently completed, will be opened for traffic Aug. 27. The contractors were Schnellbacker & Gilman, of Kansas City. The road is now completed from Osceola, Mo., to Kansas City, a distance of 117 miles. At Brownington a rich vein of coal will furnish considerable traffic for the road. Mr. D. R. Blair, Manager of the Blair Diamond Coal Co., states that the coal is of a fine bituminous quality, and that some very excellent cannel coal is to be mined. Besides the coal traffic a good agricultural business is expected along the line of the road on account of the richness of the territory through which it passes. B. R. Whitney is Chief Engineer. Mr. J. I. Blair, of New Jersey, is the principal stockholder of the company.

Kingston & Emory Gap.—It is stated that ground was broken last week at Kingston, Tenn., for this road, which is to extend from that place to the Cincinnati Southern, at Emory Gap.

Las Chiapas.—Dispatches from the City of Mexico state that a company is being formed in London and New York to build this road under the Tort concession.

Lawrence, Atchison & Southern.—It is stated that grading will be commenced within a month on the line between Lawrence and Atchison, Kan., about 45 miles. W. A. Morton is Vice-President.

Louisiana, Arkansas & Texas.—The stockholders have voted to increase the amount of first mortgage bonds, the proceeds to be used in building the extension from Malden, Mo., northeast to Grand Tower, Ill., which is now being constructed. The new line will soon be completed to Delta, where it connects with the St. Louis, Iron Mountain & Southern and the Cape Girardeau & Southwestern, giving the road a direct line to Cape Girardeau, Mo.

Louisville, St. Louis & Texas.—This road will begin operation between Owensboro, Ky., and Stephensport, Ky., a distance of 40 miles, on Aug. 25.

Louisville Southern.—Estill County, Ky., voted on Aug. 12 to subscribe $100,000 to the capital stock of the Nicholasville, Richmond, Irvine & Beattyville branch of this road, and the work of construction will begin immediately.

Manchester & Lawrence.—Two suits involving over $1,000,000 were entered at Manchester, N. H., this week against the Concord management in behalf of the owners of this road, now operated by the Boston & Maine. One suit is an action in trover to recover rolling stock and personal property valued at $300,000, which it is alleged is the property of the Manchester & Lawrence. The other suit is for $800,000 of the money said to belong to the Manchester & Lowell being earned under the agreement existing between the two roads.

McKeesport & Belle Vernon.—It is reported that the company has under consideration a proposed extension of the road from Fayette City, Pa., to the state line near Morgantown, W. Va., a distance of about 50 miles.

Meigs Elevated.—Subscriptions to the stock of this road will open Sept. 3 at the office of Soley, Gay & Dorr, Boston. It proposed with the proceeds to build two miles from Harvard square, Cambridge, toward Boston. The eight miles to Bowdoin square will cost $1,600,000. The bridge over the Charles River will be between the two present bridges.

Memphis & Atlantic.—The stockholders of the Memphis, Oxford & Columbus met in Columbus, Miss., Aug. 18, and confirmed the consolidation between the Memphis, Oxford & Columbus Companies in Tennessee and Mississippi, and the Memphis, Tuscaloosa & Atlantic, of Alabama, under this name. A committee was appointed to endeavor to raise a subscription of $150,000 in Memphis, Tenn.

Memphis & Knoxville.—It is proposed to revive the old project of building this road and that portian of the line from Whiteville, on the Tennesse Midland via Waynesboro and Lawrenceburg to Pulaski, is assured by subsidies already voted. The roadbed is graded from Henderson to Bolivar, 30 miles.

Mexican Central.—Tracklaying on the Tampico Division has now been finished from the junction north of Aguascalientes to San Luis Potosi, 36 miles, and it is expected to have the line completed through to Salinas, 59 miles further, by Sept. 1.

Milledgeville & Asylum.—The contract for building this short Georgia road has been let to S. Reed Stoney, and work will probably soon commence.

Montana Central.—It is reported that the company will soon survey an extension of the San Coolee branch from Great Falls, Mont., to the Belt Mountain mining region, a distance of about 50 miles.

Nashville & West Nashville.—This suburban line is now in operation between Nashville & West Nashville, Tenn. The depot in the latter city is not yet completed. The road is being stone ballasted by Davis & Canty, of Nashville, Tenn., who were also the contractors for constructing the line.

New Roads.—A syndicate is reported to be considering the matter of building a road from Waltham to Boston. The proposed route is as follows: From Waltham midway between the Fitchburg and the Boston & Albany to Faneuil, on the latter road; then cross the Charles River, near the arsenal and along the river to a point near Harvard Square, in Cambridge, and thence to Boston.

A project is being discussed at McKeesport, Pa., for building a road from a point on the Monongahela River, near McKeesport, to the Youghiogheny River.

New Westminster, Bellingham Bay & Seattle.—The election in the city of Westminster, B. C., on the proposition to vote a subsidy of $250,000 to the road, resulted in favor of the subsidy by a large majority.

New York, Mahoning & Western.—The parties who promised subsidies to the road are now protesting against paying their notes, on the grounds of misrepresentation and fraud in obtaining them.

Northern Pacific.—An equipment company has been formed, it is said, for the purpose of supplying the road with more rolling stock. In organization the equipment company is independent of the railroad company.

The railroad company has sold $5,000,000 of bonds to a syndicate. The block is said to be made up of $2,000,000 general third mortgage and nearly $3,000,000 branch line bonds.

The company has sold $2,000,000 third-mortgage bonds to the same syndicate that placed the $8,000,000 first offered.

It is stated that the company has decided to begin active work at once upon the Central Washington road, which was recently organized, and which will be almost parallel to the Seattle, Lake Shore & Eastern, through the Big Bend country. It starts from Cheney, 16 miles beyond Spokane Falls and 146 miles east of Wallula Junction. The present terminus of the line as projected will be the Columbia River, connecting with a line of boats on the river.

Ohio Valley.—This company has made a proposition to Pigeon township, Evansville, Ind., to extend its line from Henderson, Ky., to a point on the Ohio above Evansville, and to establish a transfer connecting with that city, if the company is voted $75,000.

Oregon Pacific.—The contract for the extension of the line 10 miles eastward from Albany, Or., has been let to Brink & West. This is the contract which Nelson Bennett, of Tacoma, Wash. Ter., abandoned last year.

Oregon Railway & Navigation Co.—J. H. Smith, of Portland, Or., has a contract for building about 90 miles of the extension from Farmington, Wash. Ter., into the Cœur d'Alene mining region of Idaho, Tex. He has a force of nearly 700 men at work on the road. The clearing on the extension has now been nearly all completed. The contract calls for the completion of the road by Jan. 1, 1889, and it is expected that it will be finished by that time.

Oregon & Washington Territory.—Grading on the road from Wallula to Walla Walla, Wash. Ter., has been completed to within a few miles of Walla Walla.

Pennsylvania.—Engineers are said to be surveying a line from Butler to New Castle, Pa., shortening the distance between these points about 85 miles; the distance between the two points by the present line is 99 miles; the air-line distance is about 14 miles.

Princeton, Marion & Ohio River.—A survey for this road has been commenced at Princeton, Ky., and will be completed very soon to the Ohio River, opposite Elizabethtown, Ill.

St. Louis, Iron Mountain & Southern.—The contract has been let to McCarthy & Kerrigan, of Little Rock, Ark., for grading the extension from Fort Smith to Greenwood, Ark., a distance of about 16 miles. Work on this section will be commenced immediately. It is thought the road will be built immediately to Gurdon, Ark., 150 miles from Fort Smith.

St. Louis, Keokuk & Northwestern.—A trackage agreement has been made with the Wabash Western, by which this road secures joint use and occupancy of the tracks and terminal facilities of the Wabash Western from St. Peters, Mo., to St. Louis, and in that city.

St. Louis, Sturgis & Battle Creek.—The contracts for grading the first 15 miles from Battle Creek to Athens, Mich., have been sublet by J. J. Burns & Co., of Battle Creek, as follows: Mitchell Bros., John Gahell, McGavock Bros., Martin T. Laley and Nevell & Ryan. The first 12 miles of the Canada & St. Louis from Goshen, Ind., to the east line of Elkhart County, has been sublet to David Sisk & Co. It is the intention to complete the line of these two roads between Battle Creek, Mich., and Goshen, Ind., a distance of 65 miles, this year.

San Luis Valley.—Articles of incorporation filed in Colorado to build a road from Villa Grove, Saguache County, to Monte Vista, and thence to La Jara, a distance of about 60 miles. The capital stock is $100,000.

Santa Ana, Fairview & Pacific.—Surveyors are running a line for the proposed extension from the present terminus at Fairview to the Pacific Coast.

Seattle, Lake Shore & Eastern.—It is stated that the road has abandoned the idea of crossing the Cascade mountains to the East through the Snoqualmie Pass as impracticable, and surveyors are now working in two sections in the Snohomish Pass and the Indian Pass for the purpose of finding a route.

South Norfolk.—Grading is in progress on this branch of the Grand Trunk, which is to extend from Simcoe, Ont., to Port Rowan, on Lake Erie, 17 miles. The work is being done by the company, no contracts being let. The construction is heavy on the first few miles from Simcoe, but on the remainder of the line the work is light. Tracklaying will probably be commenced in October, and the road will be opened for traffic in November.

South Pennsylvania.—An interview with a stockholder of this company is published in the Pittsburgh *Chronicle-Telegraph*, which is substantially as follows: "The Pittsburgh stockholders have not yet signed the organization scheme. The Philadelphia stockholders have signed, and the New York holders are willing to sign, if they have not already done so. This deadlock is expected to result in another long delay. The margin of time in which to complete the work is quite short. If the time lapses, the rights under the charter fall, and a new charter would not give the new company the present company's right of way. The Pennsylvania Company is said to hold several rights of way at points which would destroy the whole South Pennsylvania enterprise if the latter road lost those rights by the lapse of its charter. It is reported that the Pittsburgh stockholders wanted some sort of an agreement with the Vanderbilt before giving up their rights."

Springfield & Connecticut.—Organized to build the seven miles of road from Agawam through West Springfield to Springfield, Mass., which are necessary to connect with the Hartford & Connecticut Western, thus giving a route to the Poughkeepsie bridge. The capital stock is placed at $175,000.

Springhill Mines & Oxford.—About two miles of track has been laid on this road, which is being built from Springhill Mines to Oxford, N. B., by the Springhill Mining Co. The road is 14 miles in length and has considerable heavy work on it. There is a heavy stone and draw-bridge to be built on the Oxford end. The contractor is J. W. Chandler and Andrew Wheaton is Superintendent of Construction.

Stockton, Fresno & Southern.—Incorporated in California to build a narrow gauge road from Stockton southeasterly through San Joaquin, Stanislaus, Merced, Fresno and Tulare counties to Visalia, with a branch line to Fresno, a total distance of 175 miles. The capital stock is $3,500,000.

Tennessee & Coosa.—Work on the road from the Huntsville end of the line has been temporarily suspended, and the contractors and engineers have returned to Huntsville, Ala. It is not known what is the cause of the suspension. The road has been completed from Anniston, Ala., to Atalla, and the grading has been going on from both ends of the uncompleted portion. Huntsville subscribed $80,000 to the road early this year on condition that it would be completed to the Tennessee River from Huntsville by Jan. 1. About six miles of the grading out from Huntsville has been completed.

Tennessee Midland.—The contracts for building the extension from Jackson, Tenn., to the Tennessee River, 50 miles, have been awarded as follows: J. S. McTighe & Co., and Flynn & Cook, of Memphis, Tenn.; John L. Wisdom & Co., Brittain, Pierce & Co., T. L. and C. J. Houser and R. DeT. Lawrence, of Jackson, Tenn.; Finley & Clayton, of Tupelo; McGowan & Brown, of Holly Springs; L. Wright & Co., of Oxford, N. C., and D. H. Pitts & Co., of Scottsville, Va.

Vicksburg & Meridian.—The sale of the road will take place Oct. 3, and it will be probably purchased in the interest of the Cincinnati, New Orleans & Texas Pacific system, by which it is now operated.

Winona & Southwestern.—The first ground was broken at Winona, Minn., last week. Grading will now be pushed through toward Mason City, Ia., as rapidly as possible.

Winnipeg & Hudson's Bay.—The announcement is made that financial arrangements to build and equip this road have been made by a company in which Mr. Onderdonk, of New York, is interested. The syndicate wants the local government to enact a statute guaranteeing interest on $4,500,000 of bonds for 25 years at 4 per cent. There is a strong feeling against putting the act in force, and it is doubtful if it will be done.

Wisconsin Central.—Grading has been commenced on the extension from Marshfield, Wis., northwest, via Royal and Greenwood, to Chippewa Falls, a distance of about 65 miles. It is expected to complete 10 miles this year. The road will pass through heavily wooded land requiring much clearing.

This road has opened a new suburban line, the old Chicago, Harlem & Batavia. It is expected that a depot, to cost $1,000,000, will shortly be begun on the corner of Fifth avenue and Harrison street.

Wyoming & Eastern.—Incorporated in Wyoming Territory to construct a road from a point at or near Twin Creek on the southwestern boundary of Utah and Wyoming, where it is to connect with a road to Ogden and Salt Lake City. The route designated is easterly and northeaserly through the valley of Horn Fork, the South Pass, the Sweetwater, and the North Platte valleys to the Nebraska boundary. The capital stock is $10,000,000, and the road is to be about 455 miles long.

TRAFFIC AND EARNINGS.

Traffic Notes.

The recent traffic agreement between the Pennsylvania and the Baltimore & Ohio, which covers all points in competitive passenger business, provides for the following difference in rates on limited tickets in favor of the Baltimore & Ohio in both directions, between Pittsburgh and Cincinnati, Indianapolis, or St. Louis, first class, $1; second class, 50 cents; between Pittsburgh and Chicago, first-class, $1.50; second class, $1.

The Vicksburg, Shreveport & Pacific has reduced local fares from 4 cents per mile to 3, thereby making a uniform rate throughout the Queen & Crescent system.

It is announced that rates between Cincinnati and Chicago will be restored Aug. 25 to $8 limited, $8.80 unlimited, and $12 for the round trip.

The granting of milling-in-transit privileges at towns in Ohio and elsewhere east of Chicago seems to be the cause of considerable petty rate-cutting. The Chicago & Atlantic and the Lake Shore & Michigan Southern have cut under each other 1½ cents, once or twice each, on the "flat" rate from Chicago to interior points, the last report being the announcement by the Lake Shore of the following rates on grain: to Dunkirk, N. Y., and Erie, Pa., 11½ cents per 100 lbs., to Youngstown 10, and to Oil City, Pa., 11½ cents.

A sweeping reduction in rates to Montana points is announced by the Manitoba & Northern Pacific, and a serious rate war is feared, as other roads are affected.

At a meeting of the Ohio River Traffic Association, Aug. 16, the lines interested in business between Chicago and Cincinnati, Louisville and Indianapolis agreed to restore rates on passenger traffic between those points to the tariff between those points in effect last April. The restored rates are to go into effect Aug. 25.

The formation of a new dressed beef company in Pittsburgh, with a heavy capital, is announced by the press dispatches.

The "Car Famine" Begins.

There is a freight car famine on the Baltimore & Ohio, and coal operators are alarmed at the prospect of not being able to fill their contracts. Some of them are refusing to book orders until assured the road will furnish them transportation. The company is doing all it can to help the operators out of their dilemma, but it will be at least a month before the necessary relief can be furnished.

The Western roads, with few exceptions, are beginning to complain of the scarcity of freight cars. The prospect for good crops throughout the grain-raising states has convinced them that the traffic this year will greatly exceed that of the last few seasons. The Eastern roads have been called upon to furnish all the cars that they can spare, and the Western roads have been actively engaged in gathering all stray rolling-stock that might be considered seaworthy. The superintendent of a prominent road is authority for the statement that all of

the roads are in the same predicament. Provided rates are not demoralized, this state of affairs will enable the roads to retrieve some of the heavy losses incident to the railroad wars which have been upsetting things in the West. Unfortunately, however, things are not looking particularly encouraging for the settlement of difficulties in that section just now.

The car-building concerns all over the country appear to be pleased with the shortage of cars, as few, if any of the larger shops are pushed to their utmost in turning out cars.

Dressed Beef and Live Stock Rates.

The Pennsylvania and the Vanderbilt roads have announced a dressed beef rate of 25 cents, Chicago to New York, and 10 cents on live cattle. The rate to Boston is 15, and to interior New York points 7½ on live cattle. The question of the Erie's differential appears to be still unsettled.

Excursion Traffic.

The Michigan Central lately received from the Cincinnati, Hamilton & Dayton five solid trains of ten coaches each at Toledo for Niagara Falls. At the same time it received three trains of eight coaches each from the Wabash at Detroit for Niagara. There were over 4,000 passengers on the eight trains. The trains were made up of thirty-three Pullman sleepers, ten chair cars, and thirty day coaches. Over half the passengers went from Niagara to Toronto by lake.

The Michigan Central recently took 80 carloads of excursionists to Detroit in a single day from its Canada Southern division.

Oregon Business.

There is considerable movement of freight eastward from Oregon. The commodities being shipped in the largest quantities are canned goods, dried fruits and sugar, and a large share of them is going to Chicago, New York, Boston, St. Paul and Minneapolis. The Northern Pacific has obtained a good share of this business, while the Union Pacific, via Ogden, and its adjunct, the Oregon Railway & Navigation Co., via Portland, have fought hard against it. The Denver & Rio Grande, Santa Fe and Texas Pacific roads also succeeded in getting a share.

The Northern Pacific and Puget Sound railroad companies have issued a joint freight tariff, in connection with Eastern lines, that is of importance to those interested in the salmon pack of the country north of Oregon. It provides that on shipments of salmon in car-loads of not less than 20,000 lbs. from Washington Territory, British Columbia, via Duluth and the lakes to New York and Eastern points, the rate will be $1 per 100 lbs. From the same points to St. John and Halifax, New Brunswick, the rate will be $1.10 per 100 lbs.

Chicago-St. Paul Rates.

The Wisconsin Central has issued a circular authorizing a reduction in first and second class rates between Chicago and St. Paul and Minneapolis to $6.40 and $5 respectively, and announces its intention to pay commissions on those rates. It accuses the C., B. & Q. of refunding to the purchaser of a ticket a substantial part of the fare charged. It is said that the C., B. & Q. has met the cut.

The Immigrant Troubles.

The quarrel at Castle Garden has turned the last week on the question of handling baggage. Mr. Doane has refused to handle the baggage of immigrants holding tickets over the Lackawanna and the Ontario & Western. On Wednesday, in a conference between the Commissioners of Emigration and the railroads, it was settled that, subject to the approval of the full Board of Commissioners, after Aug. 31, all baggage landed at Castle Garden shall be handled by the employés of the Commissioners, and that each railroad shall pay its proportion of the expenses to the Commissioners according to the amount of baggage handled.

Anthracite Coal Tonnage.

Mr. John H. Jones, Chief of Bureau of Anthracite Coal Statistics, has issued the following statement of anthracite coal tonnage for the month of July, 1888, as compared with the same period last year:

	July.			
	1888.	1887.	Inc. or Dec.	
Phila. & Reading	606,950	608,137	D.	1,187
Lehigh Valley	697,090	516,454	I.	180,636
Central of N. J.	517,107	435,753	I.	81,354
Del., Lack. & West.	523,391	407,023	I.	116,367
Del. & Hud. Canal Co.	255,521	277,044	I.	78,476
Pennsylvania	430,226	335,856	I.	94,370
Pennsylvania Coal Co.	167,136	125,148	I.	41,988
N. Y., L. E. & W.	68,847	56,204	I.	12,642
Total	3,366,272	2,761,623	I.	604,649
From Wyoming Region	1,717,686	1,379,699	I.	33[illegible]986
" Lehigh "	705,313	531,498	I.	173,814
" Schuylkill "	943,273	850,426	I.	92,847

	Year.			
	1888.	1887.	Inc. or Dec.	
Phila. & Reading	3,244,708	3,926,722	D.	682,014
Lehigh Valley	3,360,599	3,654,978	D.	294,378
Central of N. J.	2,901,274	2,769,378	I.	131,895
Del., Lack. & West.	3,599,844	2,960,933	I.	638,910
Del. & Hud. Canal Co.	2,390,668	2,042,094	I.	348,573
Pennsylvania	2,598,842	2,062,007	I.	536,834
Pennsylvania Coal Co	909,967	800,469	I.	109,497
N. Y., L. E. & W.	515,824	448,484	I.	67,339
Total	19,521,728	18,665,070	I.	856,658
From Wyoming Region	11,870,849	9,644,840	I.	2,226,008
" Lehigh "	2,524,436	3,420,503	D.	896,067
" Schuylkill "	5,126,442	5,599,725	D.	473,283

The stock of coal on hand at tide-water shipping points July 31, 1888, was 586,469 tons; on June 30, 1888, 741,958 tons, a decrease of 155,489 tons.

This statement includes the entire production of anthracite coal, excepting that consumed by employés, and for steam and heating purposes about the mines, but does not represent the entire anthracite coal tonnage actually transported by the respective roads, adjustment being necessary in the compilation to avoid duplications, etc.

Cotton.

The cotton movement for the week ending Aug. 17 is reported as follows, in bales:

Interior markets:	1888.	1887.	Inc. or Dec.	P. c.
Receipts	4,681	11,050	D. 6,369	54.5
Shipments	8,822	12,031	D. 3,209	25.0
Stock	16,244	22,986	D. 6,742	27.2
Seaports:				
Receipts	19,449	9,649	I. 9,800	100.0
Exports	11,459	27,171	D. 15,712	55.5
Stock	175,749	108,217	I. 67,532	62.0

Coal.

The coal tonnages for the week ending Aug. 18 are reported as follows:

	1888.	1887.	Increase.	P. c.
Anthracite	920,922	711,134	209,788	29 4
Bituminous	292,489	277,383	15,106	5.4

The Cumberland coal trade for the week ending Aug. 18 amounted to 74,778 tons; and for the year to that date 2,195,044 tons.

The coal and coke tonnage of the Pennsylvania originating on lines east of Pittsburgh and Erie for the week ending Aug. 11, and the year to that date, was as follows:

	Coal.	Coke.	Total.
Total for week ending Aug. 11	214,075	76,985	291,060
Total for year 1888 to date	7,115,802	2,359,214	9,475,016
Total for year 1887 to date	6,341,195	1,996,636	8,337,831

The anthracite coal tonnage of the Belvidere division of the United Railroads of New Jersey division for the same periods was as follows:

	1888.	1887.	Inc. or Dec.
Total for week ending Aug. 11	36,339	29,386	I. 6,953
Total for year to Aug. 11	949,458	1,041,669	D. 92,211

Railroad Earnings.

A London cable dispatch says the Grand Trunk Railway statement for the last half-year shows that the gross receipts were £1,700,000; operating expenses, £1,224,200. The balance of £39,990 is available for a dividend. Seven hundred and fifty thousand pounds is carried forward on the renewal of the permanent way account. The Chicago & Grand Trunk shows a surplus of £150, as compared with a deficiency of £2,915 last year. The Detroit, Grand Haven & Milwaukee shows a deficiency of £14,000, compared with a deficiency of £9,644 last year.

The comparative statement of operations of the Nashville, Chattanooga & St. Louis Railway is as follows:

	July, 1888.	July, 1887.		
Gross earnings	$202,584	$258,877	I.	3,707
Oper. expenses	150,248	131,038	I.	19,210
Net earnings	$112,336	$127,839	D.	15,503
Interest and taxes	71,751	61,727	I.	10,024
Improvements	5,215	21,645	D.	16,430
	$76,966	$83,372	D.	6,406
Surplus	35,370	$44,467	D.	9,097

The statement of operations on Pennsylvania lines west of Pittsburgh, the Southwestern system, for the month of July, and for the year ending July, is as follows: The figures are:

West of Pittsburgh:				
Month of July:	1888.	1887.	Inc. or Dec.	
Gross earnings	$1,374,447	$1,518,121	D.	$143,674
Oper. expenses	963,705	924,320	I.	39,385
Net earnings	$410,742	$593,801	D.	$183,059
Seven months:				
Gross earnings	$9,735,630	$10,110,320	D.	$374,690
Oper. expenses	6,916,654	6,636,932	I.	279,722
Net earnings	$2,818,976	$3,473,388	D.	$654,412
Southwestern system:				
Month of July:				
Gross earnings	$1,074,848	$1,184,154	D.	$109,306
Oper. expenses	832,886	859,006	D.	26,120
Net earnings	$241,962	$325,148	D.	$83,186
Seven months:				
Gross earnings	$7,439,259	$7,822,255	D.	$382,996
Oper. expenses	6,132,832	5,776,378	I.	357,454
Net earnings	$1,306,427	$2,045,877	D.	$739,450

The earnings of the Baltimore & Ohio for July and the ten months ending July 31 are as below:

Month of July:	1888	1887	Inc. or Dec	
Gross earnings	$1,707,940	$1,665,399	I.	$44,541
Oper. expenses	1,194,159	1,170,918	I.	23,241
Net earnings	$515,781	$494,481	I.	$21,300
Ten months to July 31:				
Gross earnings	$16,664,451	$16,572,670	I.	$91,781
Oper. expenses	12,104,632	11,790,984	I.	313,648
Net earnings	$4,559,819	$4,781,686	D.	$221,867

The increase in expenditures on roadway and equipment for the ten months aggregates $558,000, included in the above statement of expenses. The earnings for July, 1887, include those of both the express and sleeping-car departments, while for 1888 they embrace nothing on account of these two services except the rental paid by the express company. The same applies to the entire ten months' earnings, as regards express, but not as regards sleeping cars, the franchise of that department having been disposed of on June 25, 1888.

The statement of the Oregon Railway & Navigation for July shows:

	1888.	1887.	Inc. or Dec.	
Gross earnings	$530,697	$444,731	I.	$85,966
Oper. expenses	345,657	230,160	I.	115,497
Net earnings	$185,040	$214,571	D.	$29,531

The statement of the New York & New England for the quarter ending June 30, as filed at Albany, shows:

	1888.	1887.	Inc. or Dec.	
Gross earnings	$1,284,844	$1,188,606	I	$96,238
Oper. expenses	915,110	823,051	I.	92,059
Net earnings	$369,734	$365,555	I.	$4,179
Other income	5,791	5,401	I.	390
Fixed charges	400,290	382,480	D.	17,810
	$24,706	$11,525	I.	$13,241
Cash on hand	53,880	12,687	I.	41,193
Def.	512,002	670,202	D.	158,200

The following is the report of earnings of the Cairo, Vincennes & Chicago for June:

Month of June:	1888.	1887.	Increase.
Gross	$54,161	$63,226	$9,065
Oper. expenses and taxes	39,482	40,315	833
Net	$14,679	$22,911	$8,232

The statement of the Chicago, Burlington & Northern for June and the half year to June 30 is as follows:

Month of June:	1888.	1887.	Decrease.
Gross earnings	$174,004	$202,637	$28,633
Oper. expenses	144,883	146,382	1,499
Net earnings	$29,121	$56,255	$27,134
Jan. 1 to June 30:			
Gross earnings	$795,361	$1,270,286	$474,925
Oper. expenses	762,344	938,710	176,366
Net earnings	$33,017	$331,576	$298,559

The statement of the Long Island for the quarter ending June 30 shows:

	1888.	1887.	Inc. or Dec.	
Gross earnings	$892,072	$798,392	I.	$93,680
Oper. expenses	571,527	474,658	I.	96,869
Net earnings	$320,545	$323,734	D.	$3,189
Other income	26,804	25,280	I.	1,524
Fixed charges	169,426	197,864	D.	28,438
Net income	$177,922	$151,149	D.	$26,775
Cash on hand	100,290	90,206	I.	9,823
Surplus	992,694	798,206	I.	194,488

Earnings of railroad lines for various periods are reported as follows:

Month of July:	1888.	1887.	Inc. or Dec.	P. c.
Balt. & Ohio:				
Lines W. of O.	$1,337,830	$1,315,776	I.	$22,054 1.6
Net	498,671	438,276	I.	60,395 13.7
Lines E. of O.	372,110	349,623	I.	22,487 6.3
Net	17,110	56,205	D.	39,095 70.0
Total all lines	1,709,940	1,665,399	I.	44,541 2.6
Net	515,781	494,481	I.	21,300 4 2
Cape F. & Y. V.	24,887	19,429	I.	5,458 26.3
Net	10,508	8,592	I.	1,916 12.5
Nash., C. & St. L.	262,584	258,877	I.	3,707 1.2
Net	112,336	127,839	D.	15,503 11.8
Rich. & W. P. Ter.				
Rich. & Danv.	315,910	305,365	I.	10,545 3.2
Net	119,870	99,795	I.	20,075 20.2
Virginia Mid. D.	154,928	133,797	I.	21,131 15.8
Net	63,906	44,323	I.	19,543 43.2
Char., Col. & A.	67,595	55,223	I.	12,372 22.0
Net	20,366	10,753	I.	9,613 90.0
Col. & Gr. Div.	36,987	29,940	I.	7,047 24 1
Net	6,369	def. 6,883	I.	13,252 217.0
W. N. Car. Div.	48,940	55,990	D.	7,050 12.7
Net	4,544	409	I.	4,135
Tot. R. & W. P. T.	621,270	580,314	I.	40,956 6.8
Net	215,055	148,447	I.	66,618 44.5

Seven months—Jan. 1 to July 31:				
Cape F. & Y. Vy.	176,265	142,760	I.	33,505 23.2
Net	77,811	65,899	I.	11,912 17.0
Rich. & W. P. Ter.				
Rich. & Danv.	2,546,573	2,286,064	I.	260,509 11.3
Net	1,130,794	1,004,168	I.	126,626 12.5
Va. Mid. Div.	990,771	881,346	I.	109,425 12.3
Net	403,565	329,536	I.	74,029 22 5
Char., C. & A.	492,429	434,044	I.	58,385 13.3
Net	185,355	153,685	I.	31,670 20.2
Col. & Gr. Div.	328,767	274,535	I.	54,232 20.0
Net	111,683	30,045	I.	81,638 270.0
W. N. Car. Div.	351,616	385,051	D.	33,435 8.6
Net	55,875	54,006	I.	1,869 1.8
Tot. R. & W. P. T.	4,710,156	4,261,040	I.	449,116 10.5
Net	1,887,272	1,571,440	I.	315,832 20.0

Month of June:				
Atch., T. & S. Fe.	1,336,409	1,541,876	D.	205,467 13 3
Net	425,591	708,043	D.	282,452 39 8
Cairo, V. & Chic.	54,161	63,226	D.	9,065 14.3
Net	14,679	22,911	D.	8,232 37.2
Den. & R. G.	678,480	677,241	I.	1,239 0 1
Net	260,700	297,760	D.	37,060 12.5
E. Tenn., V. & G.	438,397	415,371	I.	23,026 5.5
Net	192,664	75,284	I.	117,380 156 0
Knox. & Ohio	38,793	38,460	I.	333 0.9
Net	18,395	7,845	I.	10,550 142.8
Lake E. & W.	166,672	172,355	D.	6,683 3 5
Net	50,510	69,083	D.	18,573 26 1
L., N. A. & Chic.	194,678	196,427	D.	1,749 0.5
Net	77,368	70,767	I.	6,601 8.5
Mexican Central.	370,751	351,285	I.	19,466 5.4
Net	52,016	126,224	D.	74,208 58.7
Minn. & St. L.	132,298	113,459	I.	18,839 15.9
Net	28,534	33,735	D.	5,201 15.1
Oregon Imp. Co.	404,167	338,008	I.	66,159 19.5
Net	71,799	95,019	D.	23,220 24.2
Oreg. R. & N. Co.	530,697	444,731	I.	85,966 19.1
Net	185,041	205,988	D.	20,947 9.7
Rome, W. & O.	297,226	272,317	I.	24,909 8.9
Net	130,828	117,843	I.	12,985 10.2
Southern Pac. Co.:				
Atl. Sys	771,095	687,333	I.	83,762 12.1
Net	177,914	170,778	I.	7,136 4.1
Pacific Sys.	2,950,619	2,304,655	I.	585,964 24.8
Net	1,007,221	1,221,712	D.	214,491 17.5
Total So. Pa. Co.	3,721,714	3,051,988	I.	669,726 21.8
Net	1,185,135	1,392,490	D.	207,355 14.8
Wabash	506,346	539,935	D.	33,589 6.1
Net	46,931	136,134	D.	89,203 67.0
Total (gross)	$8,871,189	$8,216,679	I.	$654,510 7.9
Total (net)	2,740,191	3,359,126	D.	618,935 18.4

Six months—Jan. 1 to June 30:				
Atch., T. & S. Fe.	7,174,571	9,091,635	D.	1,917,064 21.1
Net	1,990,763	4,199,965	D.	2,209,202 52 6
Cairo, V. & C.	328,805	348,380	D.	19,575 5.4
Net	82,492	88,455	D.	5,963 5.6
Den. & R. G.	3,554,714	3,555,536	D.	822
Net	1,038,220	1,398,305	D.	360,085 25.7
E. Ten., Va. & G.	2,655,594	2,384,855	I.	270,739 11.3
Net	914,984	559,270	I.	355,714 63.6
Lake E. & West.	923,084	950,121	D.	27,037 2.8
Net	291,362	330,368	D.	39,006 11.8
L., N. A. & Chic.	1,018,012	1,032,302	D.	14,290 1.3
Net	303,696	238,631	I.	65,065 31.5
Mexican Central.	2,914,120	2,318,693	I.	595,427 25.6
Net	1,129,538	1,048,614	I.	80,924 7.6
Minn. & St. L.	634,310	728,970	D.	94,660 12.9
Net	102,425	169,036	D.	66,611 39.0
Ore Imp. Co.	2,490,581	1,804,402	I.	686,179 38.0
Net	511,996	429,523	I.	82,473 19 1
Oregon R. & N. Co.	2,792,878	2,280,959	I.	511,919 22 4
Net	891,065	844,302	I.	46,763 5.4
Rome, Wat. & Og.	1,498,510	1,385,891	I.	112,619 8.1
Net	577,136	540,261	I.	36,875 6.6
Southern Pac. Co:				
Atl. Sys	5,454,277	4,544,517	I.	909,760 20.0
Net	1,500,210	922,685	I.	577,525 62.5
Pac. Sys	16,602,073	12,615,679	I.	3,986,394 31.6
Net	5,792,022	5,499,607	I.	292,415 5.3
Tot So. Pac. Co.	22,056,352	17,160,197	I.	4,896,155 28 5
Net	7,292,234	6,422,293	I.	869,941 13 5
Wabash	2,911,966	3,082,837	D.	170,871 5.5
Net	432,088	977,809	D.	545,721 55.7
Total (gross)	$50,953,497	$46,124,778	I.	$4,828,719 10 5
Total (net)	15,557,909	17,246,832	D.	1,688,833 9.7

Early reports of monthly earnings are usually estimated in part, and are subject to correction by later statements.

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